[redacted]NWO

From: [redacted] NWD02
Sent: Wednesday, January 05, 2011 2:39 PM
To: Farhat, Jody S NWD02; 'John Stonebarger'; [redacted] NWD02; 'kinney@wapa.gov'; [redacted] NWD02; [redacted] 'bcallies@wapa.gov'; [redacted] NWD02; [redacted] NWO; 'shimek@wapa.gov'
Subject: January 2011 Reservoir Regulation Studies Graphics and Statistics (UNCLASSIFIED)
Attachments: WAPAMNTH-11-JAN.xlsx; resfcastjan.pdf; WAPA.MonthlyStudies.Graphic.JAN.2011.pptx

Classification: UNCLASSIFIED
Caveats: NONE

Everyone,

Here are the January 2011 study graphics and statistics.

If you have any questions please contact me.

Thanks,

[redacted].
Hydraulic Engineer
Missouri River Basin Water Management Division
[redacted]

Classification: UNCLASSIFIED
Caveats: NONE

Gavins Point Dam Release

(million acre-feet)

	MAX 67-09	MIN 67-09	MEAN 67-09	LAST YEAR	Dec-10 FCST	Dec-10 LD fcst	Dec-10 UD fcst		Jan-11 FCST	Jan-11 LD fcst	Jan-11 UD fcst	
JAN	1.553	0.702	1.052	0.795	0.978	0.978	0.978	*	1.138	1.045	1.291	JAN
FEB	1.685	0.549	0.968	0.574	0.834	0.834	0.834	*	1.111	0.994	1.277	FEB
MAR	2.191	0.623	1.212	0.826	0.922	0.922	0.922	*	1.389	1.313	1.389	MAR
APR	2.993	0.605	1.490	1.011	0.912	0.912	0.912	*	1.598	1.773	1.904	APR
MAY	3.664	0.651	1.734	1.147	1.550	1.550	1.550	*	1.888	2.084	2.890	MAY
JUN	3.569	0.715	1.774	1.457	1.649	1.649	1.649	*	1.880	2.041	3.094	JUN
JUL	3.782	0.495	1.978	1.629	2.152	2.152	2.152	*	1.943	2.109	3.443	JUL
AUG	3.959	0.661	2.118	1.679	2.469	2.469	2.469	*	2.041	2.091	3.443	AUG
SEP	3.894	1.102	2.095	1.790	2.653	2.653	2.653	*	2.083	1.993	3.332	SEP
OCT	4.197	0.760	2.085	1.762	3.000	3.000	3.000	*	2.152	2.035	3.443	OCT
NOV	4.165	0.448	1.813	1.164	2.749	2.749	2.749	*	2.082	1.674	3.333	NOV
DEC	2.287	0.759	1.181	0.972	1.549	1.549	1.549	*	1.383	0.769	1.722	DEC
TOTAL	37.939	8.070	19.500	14.806	21.42	21.42	21.42		20.69	19.92	30.56	TOTAL
									1.230	0.769	1.476	JAN 12
									1.150	0.719	1.343	FEB 12

JAN 12
FEB 12
* Actual

MAINSTEM ENERGY

(GWh)

	Lower Basic FCST Dec-10	Upper Basic FCST Dec-10	Lower Basic FCST Jan-11	Upper Basic FCST Jan-11	
JAN	558 *	558 *	699	775	JAN
FEB	442 *	442 *	642	748	FEB
MAR	352 *	352 *	694	666	MAR
APR	384 *	384 *	807	871	APR
MAY	664 *	664 *	988	1369	MAY
JUN	626 *	626 *	988	1386	JUN
JUL	816 *	816 *	1049	1542	JUL
AUG	970 *	970 *	1036	1549	AUG
SEP	1094 *	1094 *	904	1465	SEP
OCT	1081 *	1081 *	756	1407	OCT
NOV	1001 *	1001 *	649	1354	NOV
DEC	738 *	738 *	533	885	DEC
TOTAL	8726	8726	9745	14017	TOTAL
JAN 12			632	942	JAN 12
FEB 12			575	861	FEB 12

* Actual

MAINSTEM ENERGY

(GWh)

	MAX 67-09	MEAN 67-09	MIN 67-09	AVG 100-YR	LAST YEAR	Dec-10 FCST	Jan-11 FCST	
JAN	915	714	425	729	471	558 *	729	JAN
FEB	912	626	307	637	356	442 *	700	FEB
MAR	1,040	644	308	554	384	352 *	692	MAR
APR	1,252	688	251	711	390	384 *	751	APR
MAY	1,344	781	285	928	500	664 *	962	MAY
JUN	1,386	839	286	912	659	626 *	988	JUN
JUL	1,484	947	289	1,023	747	816 *	1070	JUL
AUG	1,520	1,001	365	1,053	781	970 *	1114	AUG
SEP	1,464	887	393	973	802	1094 *	999	SEP
OCT	1,492	804	310	928	608	1081 *	826	OCT
NOV	1,425	728	244	857	380	1001 *	820	NOV
DEC	1,035	693	419	722	530	738 *	759	DEC
TOTAL		9,352		10,027	6,608	8,726	10,410	TOTAL

JAN 12	816	JAN 12
FEB 12	746	FEB 12

* Actual

JAN 1, 2011 - BASIC CONDITION
END OF FEB 2011 - UNBAL FP +0.8 GA +0.8 OA -1.3
Elevations & Storages are for Date Shown
Avg Discharge & Energy are Monthly Values
Date of Study: January 1, 2011

	31-Dec-10	2011 31-Jan	28-Feb
FORT PECK -------			
ELEV FTMSL	2235.3	2235.0	2234.8
DISCH KCFS	7.8	9.0	9.0
GARRISON --------			
ELEV FTMSL	1841.6	1839.8	1838.3
DISCH KCFS	17.8	24.0	25.0
OAHE ------------			
ELEV FTMSL	1605.0	1605.6	1606.2
DISCH KCFS	24.8	20.5	22.8
BIG BEND --------			
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	20.6	22.8
FORT RANDALL ----			
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	16.4	17.0
GAVINS POINT ----			
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	18.5	20.0
SYSTEM ----------			
STORAGE 1000 AF	57029	56823	56826
ENERGY GWh	1429	729	700
PEAK POWER MW		2311	2317

JAN 1, 2011 - LOWER BASIC
END OF FEB 2011 - UNBAL FP +0.3 GA +0.3 OA -0.5

	31-Dec-10	2011 31-Jan	28-Feb
FORT PECK -------			
ELEV FTMSL	2235.3	2234.5	2234.0
DISCH KCFS	7.8	8.5	8.0
GARRISON --------			
ELEV FTMSL	1841.6	1839.5	1837.5
DISCH KCFS	17.8	24.0	25.0
OAHE ------------			
ELEV FTMSL	1605.0	1605.8	1606.7
DISCH KCFS	24.8	19.4	20.4
BIG BEND --------			
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	19.5	20.4
FORT RANDALL ----			
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	15.3	14.4
GAVINS POINT ----			
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	17.0	17.0
SYSTEM ----------			
STORAGE 1000 AF	57029	56683	56596
ENERGY GWh	1341	699	642
PEAK POWER MW		2311	2316

JAN 1, 2011 - UPPER BASIC
END OF FEB 2011 - UNBAL FP +1.3 GA +1.2 OA -2.1

	31-Dec-10	2011 31-Jan	28-Feb
FORT PECK -------			
ELEV FTMSL	2235.3	2235.2	2235.3
DISCH KCFS	7.8	9.0	9.0
GARRISON --------			
ELEV FTMSL	1841.6	1840.0	1838.7
DISCH KCFS	17.8	24.0	25.0
OAHE ------------			
ELEV FTMSL	1605.0	1605.2	1605.4
DISCH KCFS	24.8	22.6	25.2
BIG BEND --------			
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	22.8	25.2
FORT RANDALL ----			
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	18.6	19.5
GAVINS POINT ----			
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	21.0	23.0
SYSTEM ----------			
STORAGE 1000 AF	57029	56800	56817
ENERGY GWh	1523	775	748
PEAK POWER MW		2310	2314

DATE OF STUDY 01/05/11

JAN 1, 2011 / BASIC CONDITION /
END OF FEB 2011 - UNBAL FP +0.8 GA +0.8 OA -1.3

STUDY NO 1

TIME OF STUDY 08:37:18

VALUES IN 1000 AF EXCEPT AS INDICATED

2011

	31DEC10 INI-SUM	31JAN	2010 28FEB
--FORT PECK--			
NAT INFLOW	686	324	362
DEPLETION	-258	-152	-106
EVAPORATION			
MOD INFLOW	944	476	468
RELEASE	1053	553	500
STOR CHANGE	-109	-77	-32
STORAGE	15074	14997	14965
ELEV FTMSL	2235.3	2235.0	2234.8
DISCH KCFS	7.8	9.0	9.0
POWER		123	123
AVE POWER MW		163	163
PEAK POW MW			
ENERGY GWH	174.2	91.6	82.6
--GARRISON--			
NAT INFLOW	640	280	360
DEPLETION	-126	-76	-50
CHAN STOR	-12	-12	
EVAPORATION			
REG INFLOW	1808	898	910
RELEASE	2864	1476	1388
STOR CHANGE	-1057	-578	-479
STORAGE	19409	18831	18352
ELEV FTMSL	1841.6	1839.8	1838.3
DISCH KCFS	17.8	24.0	25.0
POWER		303	313
AVE POWER MW		477	471
PEAK POW MW			
ENERGY GWH	435.7	225.6	210.1
--OAHE--			
NAT INFLOW	110	15	95
DEPLETION	54	21	33
CHAN STOR	-29	-25	-4
EVAPORATION			
REG INFLOW	2891	1444	1446
RELEASE	2528	1259	1269
STOR CHANGE	363	186	178
STORAGE	18059	18245	18422
ELEV FTMSL	1605.0	1605.6	1606.2
DISCH KCFS	24.8	20.5	22.8
POWER		261	292
AVE POWER MW		698	701
PEAK POW MW			
ENERGY GWH	390.8	194.4	196.4
--BIG BEND--			
EVAPORATION			
REG INFLOW	2528	1259	1269
RELEASE	2538	1269	1269
STORAGE	1631	1621	1621
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	20.6	22.8
POWER		101	109
AVE POWER MW		538	529
PEAK POW MW			
ENERGY GWH	149.0	75.4	73.5
--FORT RANDALL--			
NAT INFLOW	77	27	50
DEPLETION	6	3	3
EVAPORATION			
REG INFLOW	2609	1293	1316
RELEASE	1953	1011	942
STOR CHANGE	656	282	374
STORAGE	2468	2750	3124
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	16.4	17.0
POWER		125	135
AVE POWER MW		319	339
PEAK POW MW			
ENERGY GWH	183.9	93.3	90.6
--GAVINS POINT--			
NAT INFLOW	240	108	132
DEPLETION	1	1	
CHAN STOR	11	12	-1
EVAPORATION			
REG INFLOW	2202	1130	1073
RELEASE	2248	1138	1111
STOR CHANGE	-46	-8	-38
STORAGE	388	380	342
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	18.5	20.0
POWER		65	70
AVE POWER MW		117	114
PEAK POW MW			
ENERGY GWH	95.7	48.7	47.0
--GAVINS POINT - SIOUX CITY--			
NAT INFLOW	280	100	180
DEPLETION	28	14	14
REGULATED FLOW AT SIOUX CITY			
KAF	2500	1224	1277
KCFS		19.9	23.0
--TOTAL--			
NAT INFLOW	2033	854	1179
DEPLETION	-295	-189	-106
CHAN STOR	-30	-25	-5
EVAPORATION			
STORAGE	57029	56823	56826
SYSTEM POWER		980	1042
AVE POWER MW		2311	2317
PEAK POW MW			
ENERGY GWH	1429.3	729.0	700.3
DAILY GWH		23.5	25.0

INI-SUM 31JAN 28FEB

JAN 1, 2011 - LOWER BASIC
END OF FEB 2011 - UNBAL FP +0.3 GA +0.3 OA -0.5

STUDY NO 2

DATE OF STUDY 01/05/11

TIME OF STUDY 08:37:52

VALUES IN 1000 AF EXCEPT AS INDICATED

2011

	31DEC10 INI-SUM	31JAN	2010 28FEB
--FORT PECK--			
NAT INFLOW	549	259	290
DEPLETION	-142	-86	-56
EVAPORATION			
MOD INFLOW	691	345	346
RELEASE	967	523	444
STOR CHANGE	-276	-178	-98
STORAGE	15074	14896	14798
ELEV FTMSL	2235.3	2234.5	2234.0
DISCH KCFS	7.8	8.5	8.0
POWER		116	109
AVE POWER MW		163	162
PEAK POW MW		86.4	73.3
ENERGY GWH	159.8		
--GARRISON--			
NAT INFLOW	512	224	288
DEPLETION	-88	-54	-34
CHAN STOR	-2	-7	5
EVAPORATION			
REG INFLOW	1565	794	771
RELEASE	2864	1476	1388
STOR CHANGE	-1299	-682	-617
STORAGE	19409	18727	18110
ELEV FTMSL	1841.6	1839.5	1837.5
DISCH KCFS	17.8	24.0	25.0
POWER		303	312
AVE POWER MW		475	468
PEAK POW MW		225.4	209.4
ENERGY GWH	434.8		
--OAHE--			
NAT INFLOW	88	12	76
DEPLETION	54	21	33
CHAN STOR	-29	-25	-4
EVAPORATION			
REG INFLOW	2869	1441	1427
RELEASE	2327	1191	1136
STOR CHANGE	542	250	292
STORAGE	18059	18309	18601
ELEV FTMSL	1605.0	1605.8	1606.7
DISCH KCFS	24.8	19.4	20.4
POWER		248	262
AVE POWER MW		699	704
PEAK POW MW		184.2	176.3
ENERGY GWH	360.5		
--BIG BEND--			
EVAPORATION			
REG INFLOW	2327	1191	1136
RELEASE	2337	1201	1136
STORAGE	1631	1621	1621
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	19.5	20.4
POWER		96	98
AVE POWER MW		538	529
PEAK POW MW		71.4	65.9
ENERGY GWH	137.3		
--FORT RANDALL--			
NAT INFLOW	62	22	40
DEPLETION	6	3	3
EVAPORATION			
REG INFLOW	2393	1220	1173
RELEASE	1737	938	799
STOR CHANGE	656	282	374
STORAGE	2468	2750	3124
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	15.3	14.4
POWER		117	115
AVE POWER MW		319	339
PEAK POW MW		86.7	77.0
ENERGY GWH	163.7		
--GAVINS POINT--			
NAT INFLOW	192	86	106
DEPLETION	1	1	
CHAN STOR	15	14	2
EVAPORATION			
REG INFLOW	1943	1037	906
RELEASE	1989	1045	944
STOR CHANGE	-46	-8	-38
STORAGE	388	380	342
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	17.0	17.0
POWER		60	60
AVE POWER MW		117	114
PEAK POW MW		44.8	40.1
ENERGY GWH	84.9		
--GAVINS POINT - SIOUX CITY--			
NAT INFLOW	224	80	144
DEPLETION	28	14	14
REGULATED FLOW AT SIOUX CITY			
KAF	2185	1111	1074
KCFS		18.1	19.3
--TOTAL--			
NAT INFLOW	1627	683	944
DEPLETION	-141	-101	-40
CHAN STOR	-16	-18	3
EVAPORATION			
STORAGE	57029	56683	56596
SYSTEM POWER		939	955
AVE POWER MW		2311	2316
PEAK POW MW		698.9	642.0
ENERGY GWH	1341.0	22.5	22.9
DAILY GWH			

JAN 1, 2011 - UPPER BASIC
END OF FEB 2011 - UNBAL FP +1.3 GA +1.2 OA -2.1

DATE OF STUDY 01/05/11

VALUES IN 1000 AF EXCEPT AS INDICATED

2011

TIME OF STUDY 08:36:25

	31DEC10 INI-SUM	31JAN	2010 28FEB
--FORT PECK--			
NAT INFLOW	823	389	434
DEPLETION	-219	-130	-89
EVAPORATION			
MOD INFLOW	1042	519	523
RELEASE	1053	553	500
STOR CHANGE	-11	-34	23
STORAGE	15074	15040	15063
ELEV FTMSL	2235.3	2235.2	2235.3
DISCH KCFS	7.8	9.0	9.0
POWER		123	123
AVE POWER MW		163	163
PEAK POW MW		91.6	82.7
ENERGY GWH	174.3		
--GARRISON--			
NAT INFLOW	768	336	432
DEPLETION	-131	-82	-49
CHAN STOR	-12	-12	
EVAPORATION			
REG INFLOW	1941	960	981
RELEASE	2864	1476	1388
STOR CHANGE	-924	-516	-408
STORAGE	19409	18893	18485
ELEV FTMSL	1841.6	1840.0	1838.7
DISCH KCFS	17.8	24.0	25.0
POWER		303	313
AVE POWER MW		477	473
PEAK POW MW		225.7	210.5
ENERGY GWH	436.1		
--OAHE--			
NAT INFLOW	132	18	114
DEPLETION	54	21	33
CHAN STOR	-29	-25	-4
EVAPORATION			
REG INFLOW	2913	1447	1465
RELEASE	2790	1390	1400
STOR CHANGE	123	58	65
STORAGE	18059	18117	18182
ELEV FTMSL	1605.0	1605.2	1605.4
DISCH KCFS	24.8	22.6	25.2
POWER		288	321
AVE POWER MW		695	697
PEAK POW MW		214.2	215.8
ENERGY GWH	430.0		
--BIG BEND--			
EVAPORATION	2790	1390	1400
REG INFLOW	2800	1400	1400
RELEASE	1631	1621	1621
STORAGE	1420.2	1420.0	1420.0
ELEV FTMSL	22.4	22.8	25.2
DISCH KCFS			
POWER		112	121
AVE POWER MW		538	529
PEAK POW MW		83.1	81.1
ENERGY GWH	164.2		
--FORT RANDALL--			
NAT INFLOW	92	32	60
DEPLETION	6	3	3
EVAPORATION			
REG INFLOW	2886	1429	1457
RELEASE	2230	1147	1083
STOR CHANGE	656	282	374
STORAGE	2468	2750	3124
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	18.6	19.5
POWER		142	155
AVE POWER MW		319	339
PEAK POW MW		105.6	104.0
ENERGY GWH	209.6		
--GAVINS POINT--			
NAT INFLOW	288	130	158
DEPLETION	1	1	
CHAN STOR	6	8	-2
EVAPORATION			
REG INFLOW	2523	1283	1239
RELEASE	2569	1291	1277
STOR CHANGE	-46	-8	-38
STORAGE	388	380	342
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	21.0	23.0
POWER		74	80
AVE POWER MW		117	114
PEAK POW MW		55.1	53.8
ENERGY GWH	108.9		
--GAVINS POINT - SIOUX CITY--			
NAT INFLOW	336	120	216
DEPLETION	28	14	14
REGULATED FLOW AT SIOUX CITY			
KAF	2877	1397	1479
KCFS		22.7	26.6
--TOTAL--			
NAT INFLOW	2439	1025	1414
DEPLETION	-261	-173	-88
CHAN STOR	-35	-29	-6
EVAPORATION			
STORAGE	57029	56800	56817
SYSTEM POWER		1042	1113
AVE POWER MW		2310	2314
PEAK POW MW		775.3	747.9
ENERGY GWH	1523.2	25.0	26.7
DAILY GWH			

	INI-SUM	31JAN	28FEB

JAN 1, 2011 / BASIC CONDITION / 27.8 MAF / BALANCED
FULL SERV / SHTN NAV SEAS 0 DAYS / PULSE MAR 5.0 MAY 18.3 (CALC)
Elevations & Storages are for Date Shown
Avg Discharge & Energy are Monthly Values
Date of Study: January 1, 2011

	28-Feb-11	31-Mar	2011 30-Apr	31-May	30-Jun	31-Jul	31-Aug	30-Sep	31-Oct	30-Nov	31-Dec	2012 31-Jan	29FEB
FORT PECK													
ELEV FTMSL	2234.8	2236.6	2238.1	2238.8	2241.0	2240.5	2238.4	2237.3	2237.1	2237.2	2236.0	2234.9	2234.0
DISCH KCFS	9.0	6.0	8.0	12.0	12.0	12.0	12.0	8.9	6.0	6.0	11.0	11.5	11.5
GARRISON													
ELEV FTMSL	1838.3	1840.4	1842.0	1842.7	1845.4	1845.6	1843.5	1842.3	1841.5	1840.9	1840.2	1838.7	1837.5
DISCH KCFS	25.0	18.0	22.0	26.0	30.0	30.0	30.0	24.2	18.0	18.0	19.0	25.0	25.0
OAHE													
ELEV FTMSL	1606.2	1608.5	1610.6	1611.3	1612.6	1612.6	1611.8	1610.3	1609.3	1607.7	1606.7	1606.9	1607.5
DISCH KCFS	22.8	22.0	20.7	25.9	26.7	29.7	32.2	31.6	23.4	26.1	22.6	23.7	22.7
BIG BEND													
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	22.8	22.0	20.7	25.9	26.7	29.6	31.9	31.2	23.1	25.8	22.4	23.7	22.7
FORT RANDALL													
ELEV FTMSL	1350.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	17.0	18.7	23.2	28.1	29.0	30.1	31.9	33.7	33.2	33.3	20.7	18.3	17.0
GAVINS POINT													
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	20.0	22.6	26.7	30.7	31.6	31.6	33.2	35.0	35.0	35.0	22.5	20.0	20.0
SYSTEM													
STORAGE 1000 AF	56826	59018	60544	61163	63038	63013	61533	60295	58993	57859	57168	56842	56823
ENERGY GWh	10543	692	751	962	988	1070	1114	999	826	820	759	816	746
PEAK POWER MW		2335	2354	2368	2382	2381	2375	2362	2338	2294	2255	2275	2282

JAN 1, 2011 LOWER BASIC / 18.6 MAF / BALANCED
FULL SERV / SHTN NAV SEAS 0 DAYS / PULSE MAR 5.0 MAY 12.0 (CALC)

	28-Feb-11	31-Mar	2011 30-Apr	31-May	30-Jun	31-Jul	31-Aug	30-Sep	31-Oct	30-Nov	31-Dec	2012 31-Jan	29FEB
FORT PECK													
ELEV FTMSL	2234.0	2234.5	2234.6	2233.9	2234.1	2232.5	2230.4	2229.3	2228.9	2228.4	2226.7	2225.0	2223.6
DISCH KCFS	8.0	6.0	8.0	11.0	10.0	10.0	10.0	7.8	6.0	6.0	10.0	10.5	10.5
GARRISON													
ELEV FTMSL	1837.5	1838.4	1839.2	1839.5	1840.4	1839.5	1837.6	1836.3	1835.2	1834.4	1833.0	1830.7	1828.8
DISCH KCFS	25.0	16.0	18.0	20.0	24.0	24.0	24.0	20.2	16.0	16.3	19.0	25.0	25.0
OAHE													
ELEV FTMSL	1606.7	1607.2	1606.9	1605.0	1603.8	1601.4	1598.7	1596.1	1594.6	1593.6	1594.7	1596.5	1598.6
DISCH KCFS	20.4	23.7	25.9	31.3	31.6	33.7	33.6	30.8	22.1	19.4	13.2	16.6	15.9
BIG BEND													
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	20.4	23.7	25.9	31.3	31.6	33.6	33.2	30.3	21.7	19.0	13.0	16.6	15.9
FORT RANDALL													
ELEV FTMSL	1350.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	14.4	19.2	27.5	32.5	32.9	33.7	33.0	32.5	31.7	26.4	11.3	11.2	10.0
GAVINS POINT													
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.0	21.4	29.8	33.9	34.3	34.3	34.0	33.5	33.1	28.1	12.5	12.5	12.5
SYSTEM													
STORAGE 1000 AF	56596	57550	57735	57086	57074	55750	53950	52526	51066	50041	49681	49518	49625
ENERGY GWh	9611	694	807	988	988	1049	1036	904	756	649	533	632	575
PEAK POWER MW		2320	2321	2312	2309	2292	2270	2256	2233	2192	2160	2184	2195

JAN 1, 2011 / UPPER BASIC / 38.1 MAF / BALANCED
FULL SERV / EXTENDED SEAS / PULSE MAR 5.0 MAY 20.0 (CALCULATED)

	28-Feb-11	31-Mar	2011 30-Apr	31-May	30-Jun	31-Jul	31-Aug	30-Sep	31-Oct	30-Nov	31-Dec	2012 31-Jan	29FEB
FORT PECK													
ELEV FTMSL	2235.3	2237.5	2240.4	2242.8	2248.8	2249.4	2246.6	2243.9	2241.2	2238.6	2236.9	2235.3	2234.0
DISCH KCFS	9.0	8.0	8.0	14.0	14.0	14.0	18.0	18.1	18.0	18.0	14.0	14.0	14.0
GARRISON													
ELEV FTMSL	1838.7	1842.6	1844.8	1845.1	1850.5	1851.0	1848.4	1846.0	1843.2	1840.9	1840.7	1838.9	1837.5
DISCH KCFS	25.0	18.0	26.0	40.0	42.0	42.0	42.0	42.1	42.0	42.0	22.0	30.0	30.0
OAHE													
ELEV FTMSL	1605.4	1609.4	1612.2	1613.0	1614.2	1612.4	1609.8	1608.0	1607.7	1607.0	1606.1	1606.5	1607.5
DISCH KCFS	25.2	19.1	24.1	40.4	43.9	52.9	54.3	51.8	43.8	46.2	27.1	27.2	26.1
BIG BEND													
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	25.2	19.1	24.1	40.4	43.9	52.8	54.0	51.5	43.5	46.1	27.0	27.2	26.1
FORT RANDALL													
ELEV FTMSL	1350.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	19.5	17.2	27.5	43.6	47.7	53.7	54.2	54.2	53.8	53.8	25.4	22.0	20.6
GAVINS POINT													
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	23.0	22.6	32.0	47.0	52.0	56.0	56.0	56.0	56.0	56.0	28.0	24.0	24.0
SYSTEM													
STORAGE 1000 AF	56817	60208	62565	63478	67262	67002	64486	62301	59987	57972	57322	56891	56833
ENERGY GWh	14298	666	871	1369	1386	1542	1549	1465	1407	1354	885	942	861
PEAK POWER MW		2355	2378	2383	2396	2386	2370	2362	2344	2287	2254	2274	2282

DATE OF STUDY 01/05/11 — JAN 1, 2011 / BASIC CONDITION / 27.8 MAF / BALANCED — STUDY NO 6

TIME OF STUDY 08:37:18 — FULL SERV / SHTN NAV SEAS 0 DAYS / PULSE MAR 5.0 MAY 18.3 (CALC)

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB11	2011											2012			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	7781	327	152	196	825	1190	1740	895	353	333	385	192	90	102	329	312	360
DEPLETION	418	-36	-17	-21	25	298	525	234	11	-75	-42	-41	-19	-22	-132	-153	-118
EVAPORATION	468							29	91	112	98	44	21	24	51		
MOD INFLOW	6895	363	169	217	800	892	1215	632	251	296	329	188	88	100	410	465	478
RELEASE	7071	179	83	107	476	738	714	738	738	527	369	179	83	95	676	707	661
STOR CHANGE	-176	184	86	110	324	154	501	-106	-486	-231	-39	10	5	5	-266	-242	-183
STORAGE	14965	15149	15235	15345	15669	15823	16324	16218	15732	15500	15461	15471	15475	15480	15214	14972	14789
ELEV FTMSL	2234.8	2235.7	2236.1	2236.6	2238.1	2238.8	2241.0	2240.5	2238.4	2237.3	2237.1	2237.2	2237.2	2237.2	2236.0	2234.9	2234.0
DISCH KCFS	9.0	6.0	6.0	6.0	8.0	12.0	12.0	12.0	12.0	8.9	6.0	6.0	6.0	6.0	11.0	11.5	11.5
POWER		82	82	82	110	162	163	164	163	122	83	83	83	83	149	154	153
AVE POWER MW		163	164	164	165	166	167	167	165	165	165	165	165	165	164	163	162
PEAK POW MW		29.6	13.8	17.8	79.3	120.5	117.4	121.8	121.1	87.9	61.5	29.8	13.9	15.9	110.9	114.7	106.8
ENERGY GWH	1162.8																
--GARRISON--																	
NAT INFLOW	11491	668	312	401	1380	1310	2750	1830	604	452	523	199	93	106	247	261	356
DEPLETION	989	4	2	3	-3	177	765	602	107	-142	-25	-121	-56	-65	-115	-87	-57
CHAN STOR	-24	30			-20	-39				30	28				-49	-5	
EVAPORATION	540							34	105	130	112	50	23	27	58		
REG INFLOW	17008	872	393	505	1839	1832	2699	1932	1129	1021	832	448	209	239	932	1050	1074
RELEASE	17249	536	250	321	1309	1599	1785	1845	1845	1438	1107	536	250	286	1168	1537	1438
STOR CHANGE	-241	336	143	184	530	233	914	87	-715	-417	-274	-87	-41	-47	-236	-487	-364
STORAGE	18352	18689	18831	19015	19546	19779	20693	20780	20065	19648	19373	19286	19245	19199	18962	18475	18112
ELEV FTMSL	1838.3	1839.3	1839.8	1840.4	1842.0	1842.7	1845.4	1845.6	1843.5	1842.3	1841.5	1841.2	1841.1	1840.9	1840.2	1838.7	1837.5
DISCH KCFS	25.0	18.0	18.0	18.0	22.0	26.0	30.0	30.0	30.0	24.2	18.0	18.0	18.0	18.0	19.0	25.0	25.0
POWER		226	227	227	278	330	383	386	385	308	229	228	228	228	240	313	311
AVE POWER MW		475	477	479	485	495	500	500	499	490	482	481	481	480	478	472	468
PEAK POW MW		81.2	38.1	49.1	200.3	245.5	276.1	287.5	286.1	221.7	170.2	82.1	38.3	43.7	178.7	233.2	216.3
ENERGY GWH	2648.2																
--OAHE--																	
NAT INFLOW	2975	479	223	287	660	312	423	179	65	111	66	34	16	18	12	12	90
DEPLETION	681	24	11	14	49	71	145	173	116	28	-10	1	0	1	-4	18	28
CHAN STOR	0	28			-16	-15	-15			22	24				56	-24	
EVAPORATION	533							33	104	130	111	50	23	26	1097	1507	1500
REG INFLOW	19010	1019	462	594	1904	1824	2048	1817	1689	1414	1095	518	242	277	1387	1454	1308
RELEASE	18596	652	304	396	1234	1592	1588	1824	1980	1883	1440	687	354	512	-291	53	192
STOR CHANGE	414	367	158	198	671	232	460	-7	-291	-469	-345	-169	-112	-235	18592	18645	18837
STORAGE	18422	18790	18948	19146	19817	20049	20509	20503	20212	19743	19398	19229	19117	18882	1606.7	1606.9	1607.5
ELEV FTMSL	1606.2	1607.4	1607.9	1608.5	1610.6	1611.3	1612.6	1612.6	1611.8	1610.3	1609.3	1608.8	1608.4	1607.7	32.2	22.6	22.7
DISCH KCFS	22.8	21.9	21.9	22.2	20.7	25.9	26.7	29.7	32.2	31.6	23.4	23.1	25.5	32.2		23.7	
POWER		282	283	287	271	340	352	392	424	415	306	300	331	416	291	304	293
AVE POWER MW		707	710	713	724	728	735	735	730	723	717	714	713	709	704	705	708
PEAK POW MW		101.4	47.5	62.1	194.8	252.8	253.4	291.8	315.8	298.6	227.6	108.2	55.5	79.9	216.3	226.2	204.0
ENERGY GWH	2935.9																
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	18492	652	304	396	1234	1592	1588	1818	1961	1858	1419	677	349	506	1376	1454	1308
RELEASE	18492	652	304	396	1234	1592	1588	1818	1961	1858	1419	677	349	506	1376	1454	1308
STORAGE	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	22.8	21.9	21.9	22.2	20.7	25.9	26.7	29.6	31.9	31.2	23.1	22.8	25.2	31.9	22.4	23.7	22.7
POWER		104	102	104	97	121	125	138	149	148	113	114	126	159	112	116	109
AVE POWER MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
PEAK POW MW		37.4	17.2	22.4	69.9	90.2	89.9	103.0	111.0	106.5	84.1	41.1	21.2	30.5	83.5	86.2	75.8
ENERGY GWH	1069.8																
--FORT RANDALL--																	
NAT INFLOW	910	110	51	66	152	147	152	57	39	38	5	3	1	2	12	25	49
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	117							8	25	31	25	9	4	4	10		
REG INFLOW	19206	761	355	461	1382	1730	1728	1849	1959	1858	1398	670	346	502	1376	1476	1354
RELEASE	19207	470	221	461	1382	1730	1728	1849	1959	2004	2041	991	462	528	1274	1126	980
STOR CHANGE	-1	291	134					0	0	-146	-643	-321	-116	-26	102	350	374
STORAGE	3124	3415	3549	3549	3549	3549	3549	3549	3549	3403	2760	2439	2323	2297	2399	2749	3123
ELEV FTMSL	1350.0	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	17.0	15.8	15.9	25.8	23.2	28.1	29.0	30.1	31.9	33.7	33.2	33.3	33.3	33.3	20.7	18.3	17.0
POWER		130	134	218	196	237	245	253	268	281	265	251	243	240	152	139	135
AVE POWER MW		351	356	356	356	356	356	356	356	350	319	296	287	285	293	319	339
PEAK POW MW		47.0	22.5	47.1	141.3	176.4	176.1	188.3	199.4	202.3	197.4	90.3	40.8	46.1	112.8	103.2	94.3
ENERGY GWH	1885.4																
--GAVINS POINT--																	
NAT INFLOW	1755	122	57	73	207	186	178	137	115	111	120	59	28	31	100	100	130
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	0	-19	5	-9	-2	-2	-3	-3	1	0	0	0	23	4	2
EVAPORATION	36							2	6	9	8	3	2	2	4		
REG INFLOW	20811	595	278	516	1589	1888	1880	1943	2054	2108	2152	1041	486	555	1383	1230	1112
RELEASE	20811	595	278	516	1589	1888	1880	1943	2041	2083	2152	1041	486	555	1383	1230	1150
STOR CHANGE									13	25							-38
STORAGE	342	342	342	342	342	342	342	342	355	380	380	380	380	380	380	380	342
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	20.0	20.0	20.0	28.9	26.7	30.7	31.6	31.6	33.2	35.0	35.0	35.0	35.0	35.0	22.5	20.0	20.0
POWER		69	69	98	91	103	105	105	109	114	115	115	115	115	115	76	70	69
AVE POWER MW		114	114	114	114	114	114	114	115	117	117	117	117	117	117	78	78	76
PEAK POW MW		24.8	11.6	21.2	65.6	76.3	75.3	77.8	80.9	82.1	85.5	41.4	19.3	22.1	56.7	52.0	48.3
ENERGY GWH	840.8																
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	2680	261	122	157	540	400	350	240	144	109	86	42	19	22	56	40	92
DEPLETION	266	7	3	4	22	36	31	39	36	24	11	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	23225	850	397	669	2107	2252	2199	2144	2149	2168	2227	1077	503	574	1426	1256	1228
KCFS		28.6	28.6	37.5	35.4	36.6	37.0	34.9	35.0	36.4	36.2	36.2	36.2	36.2	23.2	20.4	21.4
--TOTAL--																	
NAT INFLOW	27592	1968	918	1180	3764	3545	5593	3338	1320	1154	1185	528	246	282	744	750	1077
DEPLETION	2548	0	0	0	102	610	1502	1105	295	-163	-63	-149	-69	-79	-209	-204	-130
CHAN STOR	-26	60	0	-19	-30	-64	-17	-2	-3	49	52	0	0	-1	-28	-24	2
EVAPORATION	1797							112	352	437	375	167	77	88	189		
STORAGE	56826	58005	58526	59018	60544	61163	63038	63013	61533	60295	58993	58425	58161	57859	57168	56842	56823
SYSTEM POWER																	
AVE POWER MW		893	897	1017	1043	1293	1373	1439	1498	1388	1111	1091	1125	1240	1020	1096	1071
PEAK POW MW		2328	2330	2335	2354	2368	2382	2381	2375	2362	2338	2311	2300	2294	2255	2275	2282
ENERGY GWH	10542.9	321.4	150.8	219.8	751.2	961.7	988.3	1070.3	1114.3	999.1	826.3	392.8	189.0	238.2	758.8	815.5	745.5
DAILY GWH		21.4	21.5	24.4	25.0	31.0	32.9	34.5	35.9	33.3	26.7	26.2	27.0	29.8	24.5	26.3	25.7
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

DATE OF STUDY 01/05/11

JAN 1, 2011 LOWER BASIC / 18.6 MAF / BALANCED
FULL SERV / SHTN NAV SEAS 0 DAYS / PULSE MAR 5.0 MAY 12.0 (CALC)

STUDY NO 8

TIME OF STUDY 08:37:52

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB11		2011										2012			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	5234	212	99	127	536	714	1044	537	282	266	308	154	72	82	263	250	288
DEPLETION	373	-17	-8	-10	38	195	405	219	1	-108	-90	-24	-11	-13	-80	-69	-55
EVAPORATION	533							33	103	128	111	50	23	27	57		
MOD INFLOW	4328	229	107	138	498	519	639	285	178	246	287	127	60	68	286	319	343
RELEASE	6401	179	83	107	476	676	595	615	615	464	369	179	83	95	615	646	604
STOR CHANGE	-2073	51	24	30	22	-157	44	-330	-437	-218	-82	-51	-24	-27	-329	-327	-261
STORAGE	14798	14849	14873	14903	14925	14768	14812	14481	14044	13826	13744	13693	13669	13642	13313	12987	12726
ELEV FTMSL	2234.0	2234.3	2234.4	2234.5	2234.6	2233.9	2234.1	2232.5	2230.4	2229.3	2228.9	2228.6	2228.5	2228.4	2226.7	2225.0	2223.6
DISCH KCFS	8.0	6.0	6.0	6.0	8.0	11.0	10.0	10.0	10.0	7.8	6.0	6.0	6.0	6.0	10.0	10.5	10.5
POWER																	
AVE POWER MW		82	82	82	109	148	136	136	135	105	81	81	81	80	133	138	137
PEAK POW MW		162	163	163	163	162	162	161	160	159	158	158	158	158	157	155	154
ENERGY GWH	1038.9	29.5	13.8	17.7	78.7	109.9	97.9	100.9	100.3	75.6	60.0	29.0	13.5	15.5	99.1	102.5	95.2
--GARRISON--																	
NAT INFLOW	7601	434	202	260	897	786	1650	1098	483	362	418	159	74	85	198	209	285
DEPLETION	933	15	7	9	21	111	524	493	111	-107	20	-93	-43	-50	-52	-22	-12
CHAN STOR	-25	20			-20	-30	10			22	18				-40	-5	
EVAPORATION	618							39	121	149	128	57	27	30	65		
REG INFLOW	12426	617	279	358	1332	1322	1731	1181	866	806	657	373	174	199	759	872	901
RELEASE	14959	476	222	286	1071	1230	1428	1476	1476	1200	984	476	222	270	1168	1537	1438
STOR CHANGE	-2533	141	56	73	261	92	303	-295	-610	-394	-327	-103	-48	-71	-409	-666	-537
STORAGE	18110	18251	18307	18380	18641	18733	19036	18741	18131	17737	17410	17307	17259	17188	16779	16114	15577
ELEV FTMSL	1837.5	1838.0	1838.1	1838.4	1839.2	1839.5	1840.4	1839.5	1837.6	1836.3	1835.2	1834.8	1834.7	1834.4	1833.0	1830.7	1828.8
DISCH KCFS	25.0	16.0	16.0	16.0	18.0	20.0	24.0	24.0	24.0	20.2	16.0	16.0	16.0	17.0	19.0	25.0	25.0
POWER																	
AVE POWER MW		199	200	200	225	251	302	302	299	249	197	196	196	208	231	299	295
PEAK POW MW		470	470	471	474	475	479	476	468	464	460	458	458	457	452	443	436
ENERGY GWH	2230.8	71.8	33.6	43.2	162.4	186.8	217.4	224.6	222.7	179.6	146.6	70.6	32.9	39.9	171.5	222.3	205.1
--OAHE--																	
NAT INFLOW	1951	312	145	187	429	187	254	107	52	89	53	27	13	14		10	72
DEPLETION	681	24	11	14	49	71	145	173	116	28	-10	1	0	1	12	18	28
CHAN STOR	-2	36			-8	-8	-16			17	19			-5	-9	-27	
EVAPORATION	549							36	109	133	113	50	23	27	58		
REG INFLOW	15679	800	356	458	1443	1338	1521	1374	1302	1145	953	452	211	252	1089	1502	1482
RELEASE	18043	647	300	513	1541	1922	1880	2072	2069	1835	1361	586	308	259	814	1023	913
STOR CHANGE	-2364	153	56	-55	-98	-584	-359	-698	-766	-691	-409	-134	-98	-6	275	479	569
STORAGE	18601	18754	18811	18755	18657	18073	17714	17016	16250	15560	15151	15017	14919	14913	15188	15667	16237
ELEV FTMSL	1606.7	1607.2	1607.4	1607.2	1606.9	1605.0	1603.8	1601.4	1598.7	1596.1	1594.6	1594.0	1593.7	1593.6	1594.7	1596.5	1598.6
DISCH KCFS	20.4	21.7	21.6	28.8	25.9	31.3	31.6	33.7	33.6	30.8	22.1	19.7	22.2	16.3	13.2	16.6	15.9
POWER																	
AVE POWER MW		280	279	370	333	399	400	422	415	376	267	237	266	196	159	201	194
PEAK POW MW		706	707	706	705	695	688	676	661	649	641	639	637	637	642	651	661
ENERGY GWH	2715.5	100.7	46.9	80.0	239.9	296.9	287.8	313.9	309.0	270.4	198.9	85.2	44.7	37.5	118.6	149.9	135.3
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	17914	647	300	513	1541	1922	1880	2064	2044	1804	1334	574	303	252	800	1023	913
RELEASE	17914	647	300	513	1541	1922	1880	2064	2044	1804	1334	574	303	252	800	1023	913
STORAGE	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	20.4	21.7	21.6	28.8	25.9	31.3	31.6	33.6	33.2	30.3	21.7	19.3	21.8	15.9	13.0	16.6	15.9
POWER																	
AVE POWER MW		103	101	135	121	146	148	157	156	144	106	97	109	80	66	82	76
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	1032.3	37.1	17.0	29.1	87.3	108.8	106.4	116.9	115.7	103.5	79.1	34.9	18.4	15.4	48.9	60.8	53.0
--FORT RANDALL--																	
NAT INFLOW	599	72	33	43	99	88	91	34	31	30	4	3	1	1	10	20	39
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	146							10	32	39	31	12	5	5	12		
REG INFLOW	18287	717	333	556	1636	2001	1959	2070	2028	1788	1306	563	298	248	795	1040	949
RELEASE	18288	426	199	556	1636	2001	1959	2070	2028	1934	1949	884	414	274	692	690	575
STOR CHANGE	0	291	134	0	0			0	0	-146	-643	-321	-116	-26	103	350	374
STORAGE	3124	3415	3549	3549	3549	3549	3549	3549	3549	3403	2760	2439	2323	2297	2400	2750	3124
ELEV FTMSL	1350.0	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	14.4	14.3	14.3	31.1	27.5	32.5	32.9	33.7	33.0	32.5	31.7	29.7	29.9	17.3	11.3	11.2	10.0
POWER																	
AVE POWER MW		118	121	262	232	274	277	283	277	271	254	224	218	126	83	85	80
PEAK POW MW		351	356	356	356	356	356	356	356	350	319	296	287	285	293	319	339
ENERGY GWH	1812.5	42.6	20.3	56.6	166.9	203.6	199.2	210.4	206.3	195.4	188.7	80.7	36.7	24.2	61.8	63.6	55.6
--GAVINS POINT--																	
NAT INFLOW	1235	79	37	48	135	112	107	82	92	89	96	47	22	25	80	80	104
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	7	0	0	-32	7	-10	-1	-1	1	1	1	4	0	23	11	0	2
EVAPORATION	45							3	8	11	10	4	2	2	5		
REG INFLOW	19371	506	236	571	1773	2084	2041	2109	2104	2018	2035	925	432	317	769	769	681
RELEASE	19371	506	236	571	1773	2084	2041	2109	2091	1993	2035	925	432	317	769	769	719
STOR CHANGE									13	25							-38
STORAGE	342	342	342	342	342	342	342	342	355	380	380	380	380	380	380	380	342
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.0	17.0	17.0	32.0	29.8	33.9	34.3	34.3	34.0	33.5	33.1	31.1	31.1	20.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		59	59	106	100	110	111	111	110	111	111	106	106	71	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	780.4	21.2	9.9	22.8	72.3	81.6	79.6	82.2	82.1	79.8	82.5	38.3	17.9	13.5	33.0	33.0	30.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1784	170	79	102	351	240	210	144	115	87	69	33	15	18	45	32	74
DEPLETION	266	7	3	4	22	36	31	39	36	24	11	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	20889	669	312	669	2102	2288	2220	2214	2170	2056	2093	952	444	332	801	787	779
KCFS		22.5	22.5	37.5	35.3	37.2	37.3	36.0	35.3	34.6	34.0	32.0	32.0	20.9	13.0	12.8	13.5
--TOTAL--																	
NAT INFLOW	18404	1279	597	767	2447	2127	3356	2002	1055	923	948	422	197	225	596	601	862
DEPLETION	2447	30	14	18	139	441	1141	981	289	-161	-66	-104	-49	-55	-94	-55	-22
CHAN STOR	-20	56	0	-32	-21	-47	-7	-1	1	39	38	3	0	19	-38	-32	2
EVAPORATION	2019							129	398	491	419	186	86	98	212		
STORAGE	56596	57232	57502	57550	57735	57086	57074	55750	53950	52526	51066	50456	50171	50041	49681	49518	49625
SYSTEM POWER																	
AVE POWER MW		841	842	1154	1121	1327	1373	1410	1393	1256	1016	941	976	760	716	850	826
PEAK POW MW		2321	2320	2320	2321	2312	2309	2292	2270	2256	2233	2206	2195	2192	2160	2184	2195
ENERGY GWH	9610.4	302.9	141.5	249.3	807.4	987.6	988.3	1048.9	1036.2	904.1	755.8	338.7	164.0	145.9	532.9	632.1	574.9
DAILY GWH		20.2	20.2	27.7	26.9	31.9	32.9	33.8	33.4	30.1	24.4	22.6	23.4	18.2	17.2	20.4	19.8

	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

DATE OF STUDY 01/05/11 — JAN 1, 2011 UPPER BASIC / 38.1 MAF / BALANCED — STUDY NO 5

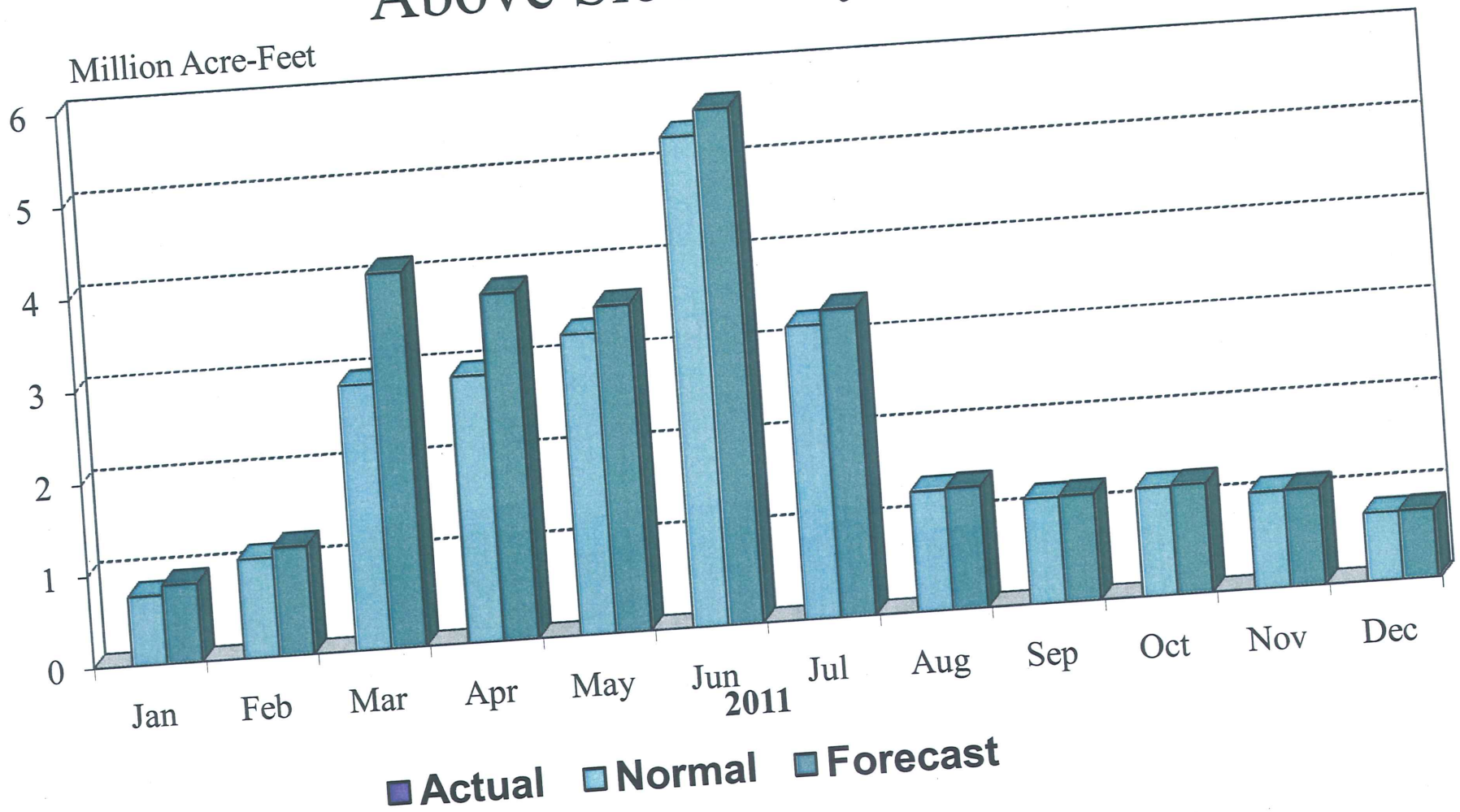
TIME OF STUDY 08:36:25 — FULL SERV / EXTENDED SEAS / PULSE MAR 5.0 MAY 20.0 (CALC)

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB11		2011										2012			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	10676	441	206	264	1114	1666	2784	1253	424	400	462	231	108	123	395	374	432
DEPLETION	191	-24	-11	-14	-23	260	513	204	-62	-129	-89	-30	-14	-16	-123	-146	-105
EVAPORATION	341							23	74	91	78	18	8	9	39		
MOD INFLOW	10144	465	217	279	1137	1406	2271	1026	412	438	473	242	113	129	479	520	537
RELEASE	10414	238	111	143	476	861	833	861	1107	1079	1107	536	250	286	861	861	805
STOR CHANGE	-270	227	106	136	661	545	1438	165	-695	-642	-634	-293	-137	-156	-381	-341	-268
STORAGE	15063	15289	15395	15531	16192	16737	18175	18340	17645	17003	16369	16076	15940	15783	15402	15061	14793
ELEV FTMSL	2235.3	2236.3	2236.8	2237.5	2240.4	2242.8	2248.8	2249.4	2246.6	2243.9	2241.2	2239.9	2239.3	2238.6	2236.9	2235.3	2234.0
DISCH KCFS	9.0	8.0	8.0	8.0	8.0	14.0	14.0	14.0	18.0	18.1	18.0	18.0	18.0	18.0	14.0	14.0	14.0
POWER		110	110	110	111	168	171	173	172	170	168	166	166	165	165	164	163
AVE POWER MW		164	164	165	167	169	173	173	171	169	167	166	166	165	164	163	162
PEAK POW MW		39.5	18.5	23.8	79.7	124.7	122.9	128.8	127.9	122.3	124.9	59.9	27.8	31.7	122.6	121.7	113.1
ENERGY GWH	1390.0																
--GARRISON--																	
NAT INFLOW	15931	902	421	541	1863	1834	4400	2562	725	542	628	239	112	127	296	313	427
DEPLETION	997	4	2	3	18	100	802	621	93	-133		-118	-55	-63	-117	-96	-64
CHAN STOR	-46	10				-58			-37	-1	1				39		
EVAPORATION	386							27	84	104	88	20	9	11	44		
REG INFLOW	24915	1145	530	681	2321	2537	4431	2775	1617	1650	1648	872	407	465	1269	1270	1296
RELEASE	25286	536	250	321	1547	2460	2499	2583	2583	2504	2583	1250	583	666	1353	1845	1726
STOR CHANGE	-371	610	280	360	774	78	1932	192	-965	-854	-934	-377	-176	-201	-83	-575	-429
STORAGE	18485	19095	19375	19734	20508	20586	22518	22710	21745	20891	19957	19579	19403	19202	19119	18544	18115
ELEV FTMSL	1838.7	1840.6	1841.5	1842.6	1844.8	1845.1	1850.5	1851.0	1848.4	1846.0	1843.2	1842.1	1841.6	1840.9	1840.7	1838.9	1837.5
DISCH KCFS	25.0	18.0	18.0	18.0	26.0	40.0	42.0	42.0	42.0	42.1	42.0	42.0	42.0	42.0	22.0	30.0	30.0
POWER		227	228	229	332	497	502	504	503	501	499	493	484	481	278	376	372
AVE POWER MW		480	482	493	499	500	504	504	502	500	498	486	483	480	480	473	468
PEAK POW MW		81.6	38.3	49.4	239.3	369.5	361.2	375.0	374.3	360.9	371.4	177.6	81.2	92.4	206.9	279.8	259.2
ENERGY GWH	3718.1																
--OAHE--																	
NAT INFLOW	4085	647	302	388	891	437	677	251	78	133	79	40	19	21	12	14	108
DEPLETION	681	24	11	14	49	71	145	173	116	28	-10	1	0	1	18	18	28
CHAN STOR	-15	28			-31	-53	-7			0	0				80	-32	
EVAPORATION	359							25	77	94	81	19	9	10	42		
REG INFLOW	28316	1187	541	695	2358	2773	3024	2635	2467	2514	2591	1269	592	677	1379	1808	1806
RELEASE	27660	562	266	347	1435	2483	2610	3252	3336	3083	2693	1286	634	831	1667	1673	1502
STOR CHANGE	657	625	274	348	923	290	414	-617	-869	-569	-102	-16	-41	-154	-288	135	304
STORAGE	18182	18808	19082	19430	20353	20643	21057	20440	19571	19003	18900	18884	18842	18688	18400	18535	18839
ELEV FTMSL	1605.4	1607.4	1608.3	1609.4	1612.2	1613.0	1614.2	1612.4	1609.8	1608.0	1607.7	1607.7	1607.5	1607.0	1606.1	1606.5	1607.5
DISCH KCFS	25.2	18.9	19.2	19.4	24.1	40.4	43.9	52.9	54.3	51.8	43.8	43.2	45.6	52.4	27.1	27.2	26.1
POWER		243	248	253	316	532	580	683	688	655	562	554	585	655	348	348	336
AVE POWER MW		707	712	718	732	737	743	734	720	711	709	709	708	705	700	703	708
PEAK POW MW		87.4	41.7	54.6	227.8	395.7	417.7	508.4	512.0	471.4	418.4	199.6	98.2	125.7	258.7	259.3	233.7
ENERGY GWH	4310.3																
--BIG BEND--																	
EVAPORATION	71							5	15	19	16	4	2	2	9		
REG INFLOW	27589	562	266	347	1435	2483	2610	3247	3321	3064	2677	1282	632	829	1659	1673	1502
RELEASE	27589	562	266	347	1435	2483	2610	3247	3321	3064	2677	1282	632	829	1659	1673	1502
STORAGE	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	25.2	18.9	19.2	19.4	24.1	40.4	43.9	52.8	54.0	51.5	43.5	43.1	45.5	52.3	27.0	27.2	26.1
POWER		90	90	91	113	189	205	247	252	243	211	213	225	257	135	133	125
AVE POWER MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
PEAK POW MW		32.2	15.1	19.7	81.3	140.5	147.7	183.6	187.7	175.2	157.1	76.7	37.7	49.3	100.3	99.0	87.0
ENERGY GWH	1590.1																
--FORT RANDALL--																	
NAT INFLOW	1251	149	70	89	205	206	243	80	47	46	6	4	2	2	14	30	59
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	81							6	19	24	18	4	2	2	7		
REG INFLOW	28681	710	335	435	1636	2680	2841	3303	3334	3080	2663	1281	631	828	1665	1700	1558
RELEASE	28681	419	201	435	1636	2680	2841	3303	3334	3226	3306	1602	747	854	1562	1350	1184
STOR CHANGE	0	291	134					0	0	-146	-643	-321	-116	-26	103	350	374
STORAGE	3124	3415	3549	3549	3549	3549	3549	3549	3549	3403	2760	2439	2323	2297	2400	2750	3124
ELEV FTMSL	1350.0	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	19.5	14.1	14.5	24.4	27.5	43.6	47.7	53.7	54.2	54.2	53.8	53.8	53.8	53.8	25.4	22.0	20.6
POWER		116	122	206	232	343	356	355	355	352	335	306	290	284	185	166	163
AVE POWER MW		351	356	356	356	356	356	355	355	349	317	295	286	283	294	319	339
PEAK POW MW		41.9	20.6	44.5	166.9	254.9	256.4	264.2	264.2	253.6	249.4	110.3	48.8	54.6	137.9	123.5	113.6
ENERGY GWH	2405.1																
--GAVINS POINT--																	
NAT INFLOW	2311	166	77	99	279	260	285	192	138	133	144	71	33	38	120	120	156
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-4	10	-1	-19	-6	-31	-8	-11	-1	0	1	0	0	0	53	6	3
EVAPORATION	24							2	5	6	6	1	1	1	3		
REG INFLOW	30850	595	278	516	1904	2890	3094	3443	3456	3357	3443	1666	778	889	1722	1476	1343
RELEASE	30850	595	278	516	1904	2890	3094	3443	3443	3332	3443	1666	778	889	1722	1476	1381
STOR CHANGE									13	25							-38
STORAGE	342	342	342	342	342	342	342	342	355	380	380	380	380	380	380	380	342
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	23.0	20.0	20.0	28.9	32.0	47.0	52.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	28.0	24.0	24.0
POWER		69	69	98	106	112	111	111	112	114	115	115	115	115	79	79	78
AVE POWER MW		114	114	114	114	112	111	111	112	115	115	115	115	115	78	78	76
PEAK POW MW		24.8	11.6	21.2	76.0	83.7	80.2	82.3	83.0	82.1	85.5	41.4	19.3	22.1	58.5	58.7	54.5
ENERGY GWH	884.7																
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	3646	353	165	212	729	560	560	336	173	131	103	50	23	27	67	48	110
DEPLETION	266	7	3	4	22	36	31	39	36	24	11	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	34230	941	439	723	2611	3414	3623	3740	3580	3439	3535	1710	798	912	1776	1510	1477
KCFS		31.6	31.6	40.5	43.9	55.5	60.9	60.8	58.2	57.8	57.5	57.5	57.5	57.5	28.9	24.6	25.7
--TOTAL--																	
NAT INFLOW	37900	2657	1239	1593	5081	4963	8949	4674	1585	1385	1422	634	296	338	892	899	1292
DEPLETION	2329	12	6	7	75	495	1527	1094	208	-208	-85	-135	-63	-72	-202	-206	-124
CHAN STOR	-63	49	-1	-19	-37	-141	-15	-11	-38	-2	2	0	0	-1	174	-26	3
EVAPORATION	1262							88	274	338	287	67	31	35	143		
STORAGE	56817	58570	59364	60208	62565	63478	67262	67002	64486	62301	59987	58979	58509	57972	57322	56891	56833
SYSTEM POWER		854	867	987	1210	1840	1925	2073	2082	2035	1891	1848	1864	1958	1189	1266	1237
AVE POWER MW		2333	2338	2355	2378	2383	2396	2386	2370	2362	2344	2308	2295	2287	2254	2274	2282
PEAK POW MW		307.4	145.7	213.2	870.9	1369.0	1386.2	1542.3	1549.1	1465.4	1406.8	665.4	313.1	375.9	884.9	941.9	861.0
ENERGY GWH	14298.2	20.5	20.8	23.7	29.0	44.2	46.2	49.8	50.0	48.8	45.4	44.4	44.7	47.0	28.5	30.4	29.7
DAILY GWH																	
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

CY 2011 Missouri River Runoff

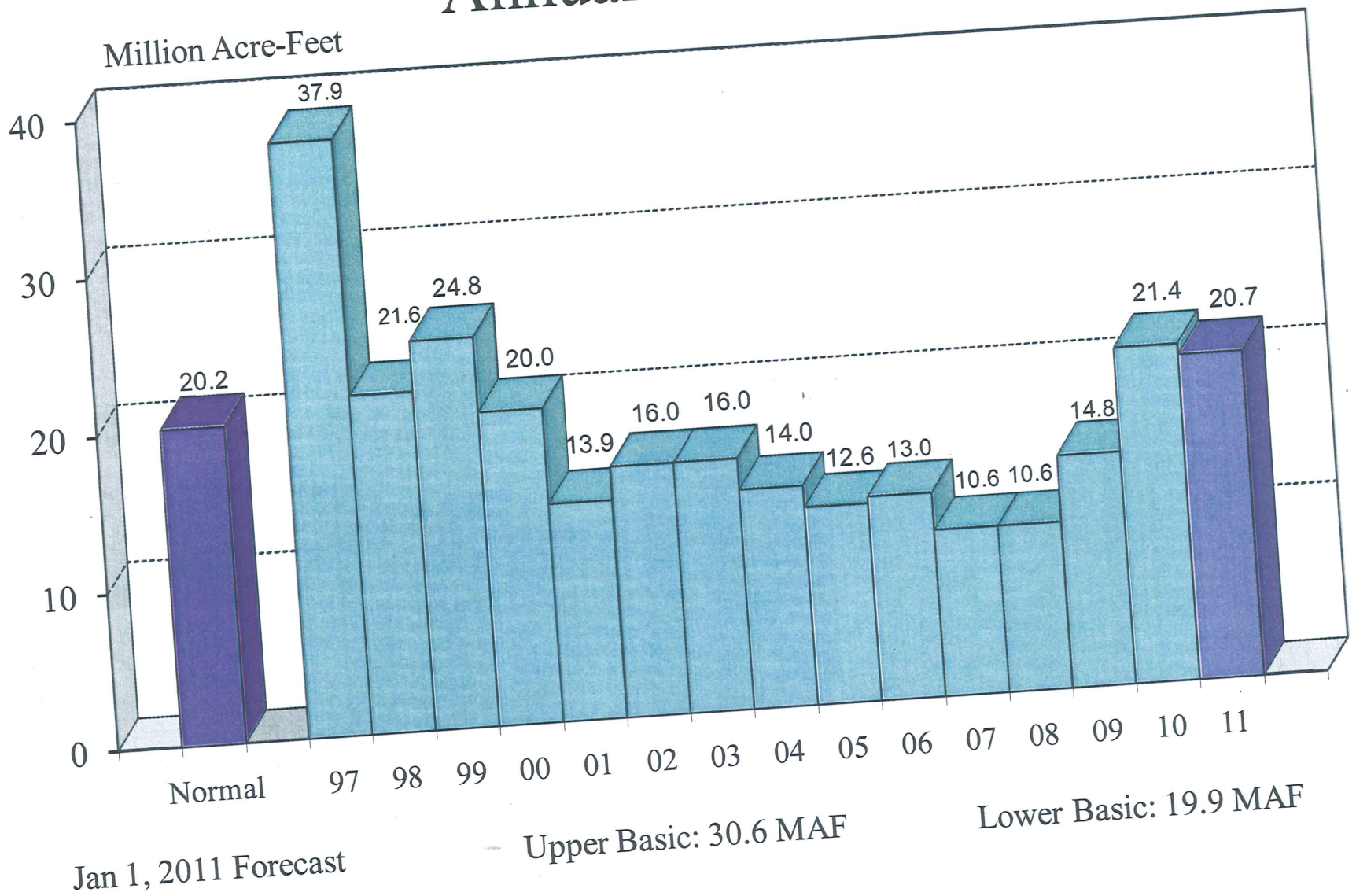
Above Sioux City, Iowa



Jan 1, 2011 Forecast – 27.8 MAF - 112%
Normal: 24.8 MAF

Gavins Point

Annual Release



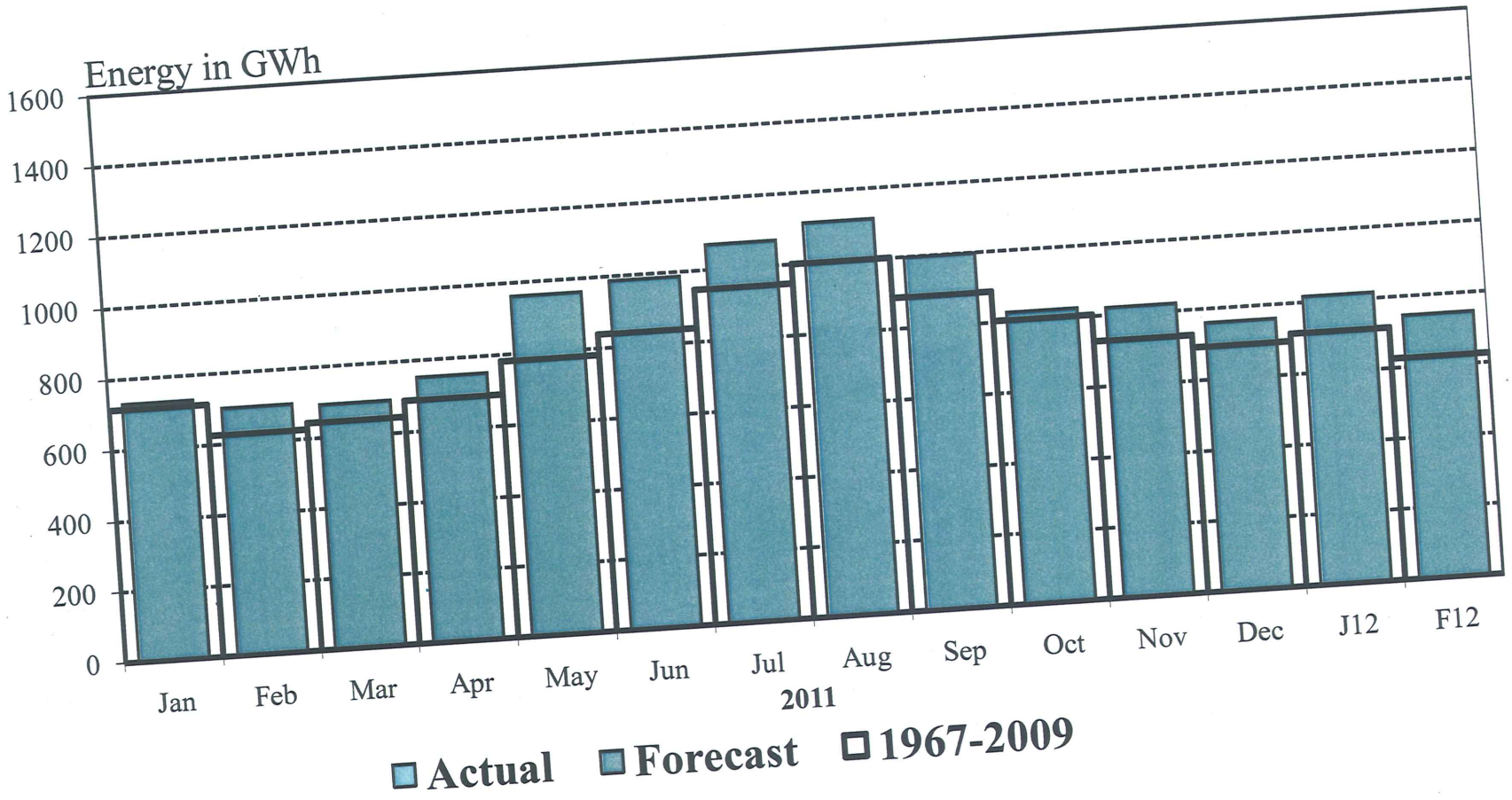
Jan 1, 2011 Forecast

Upper Basic: 30.6 MAF

Lower Basic: 19.9 MAF

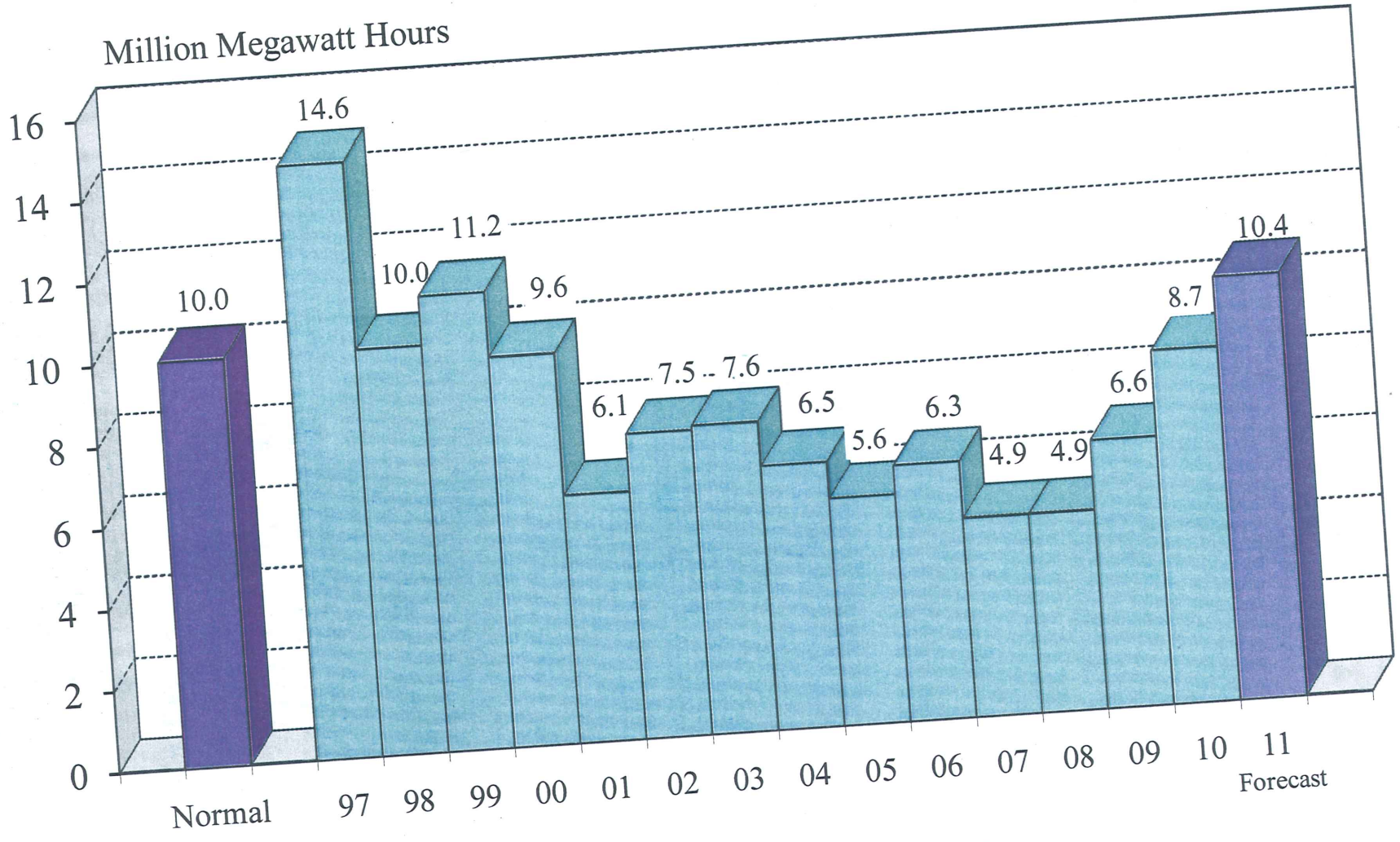
Missouri River Mainstem System

Forecasted Energy Generation



Upper Basic: 14,020 GWh
Basic: 10,410 GWh
Lower Basic: 9,750 GWh

Mainstem System Generation



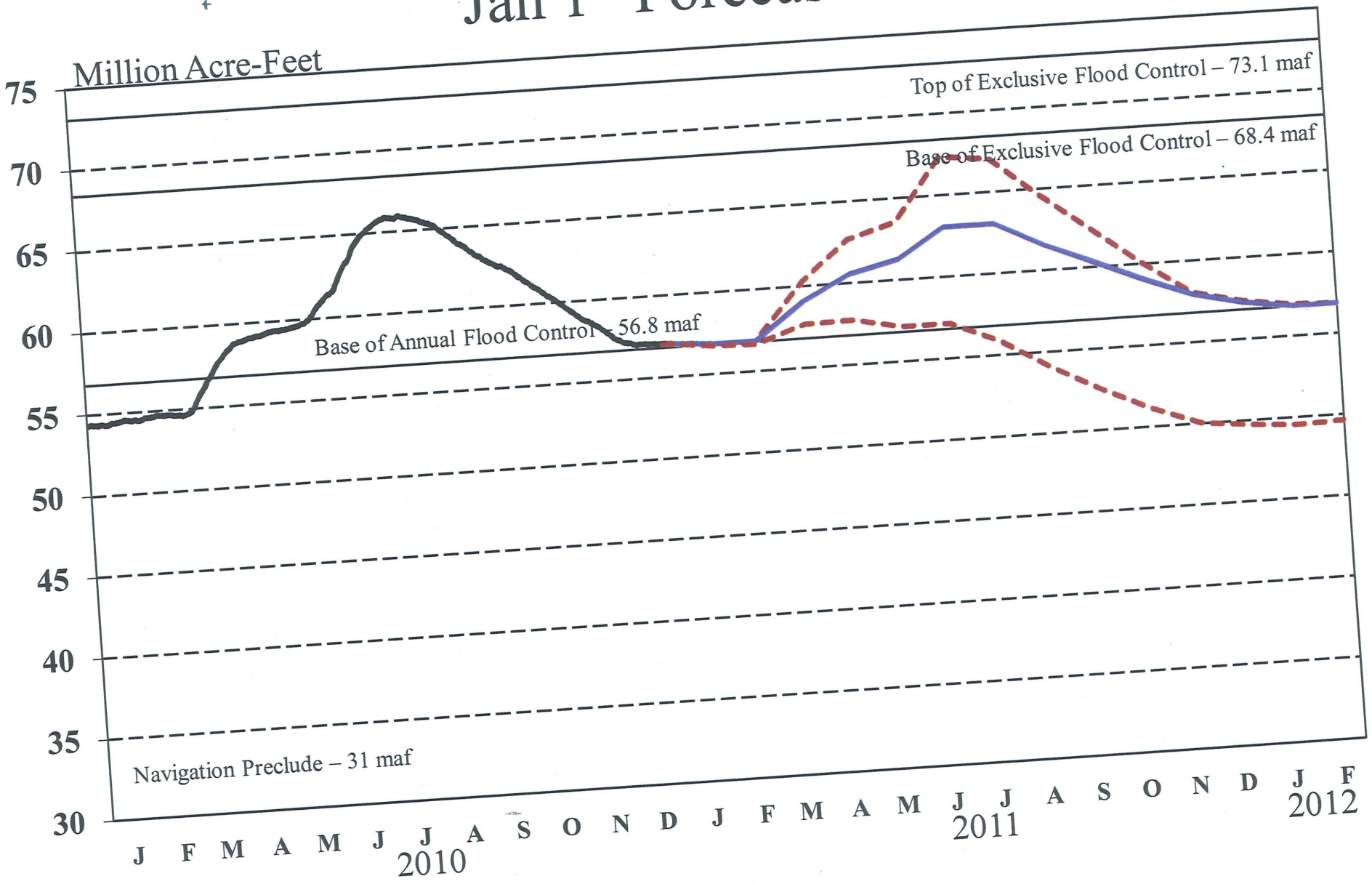
Jan 1, 2011 Forecast

Upper Basic: 14.0

Lower Basic: 9.7

System Storage

Jan 1st Forecast



[redacted] NWO

From: [redacted] NWD02
Sent: Wednesday, January 05, 2011 1:25 PM
To: Farhat, Jody S NWD02; [redacted] NWD02; [redacted] NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted], [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWD02; Johnston, Paul T NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; NWD02; [redacted] NWO; [redacted] NWO; Schenk, Kathryn M NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; Farmer, Monique L NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO
Subject: Final January 2011 Monthly Reservoir Studies (UNCLASSIFIED)
Attachments: Runoff_Forecast_Jan2011.pdf; Jan.2011-notes.docx; resfcastjan.pdf

Classification: UNCLASSIFIED
Caveats: NONE

All-

Enclosed are the Final January Monthly Reservoir Studies. No changes from the draft studies.

Thanks,

[redacted]
Hydraulic Engineer
Missouri River Basin Water Management
[redacted]

Classification: UNCLASSIFIED
Caveats: NONE

Missouri River Basin
Calendar Year 2011
Forecasted

3-Jan-11

Reach Above	Fort Peck	Garrison	Oahe	Fort Randall	Gavins Point	Sioux City	Summation above Gavins Point	Summation above Sioux City	Accumulated Summation above Sioux City
				Values in 1000 Acre Feet					
	(Forecast)								
JAN 2011	324	280	15	27	108	100	754	854	854
NORMAL	312	261	12	25	100	40	710	750	750
DEPARTURE	12	19	3	2	8	60	44	104	104
% OF NORM	104%	107%	125%	108%	108%	250%	106%	114%	114%
FEB 2011	362	360	95	50	132	180	999	1,179	2,033
NORMAL	360	356	90	49	130	92	985	1,077	1,827
DEPARTURE	2	4	5	1	2	88	14	102	206
% OF NORM	101%	101%	106%	102%	102%	196%	101%	109%	111%
MAR 2011	675	1,380	990	228	253	540	3,526	4,066	6,099
NORMAL	596	1,003	567	209	206	299	2,581	2,880	4,707
DEPARTURE	79	377	423	19	47	241	945	1,186	1,392
% OF NORM	113%	138%	175%	109%	123%	181%	137%	141%	130%
APR 2011	825	1,380	660	152	207	540	3,224	3,764	9,863
NORMAL	649	1,080	481	144	180	360	2,534	2,894	7,601
DEPARTURE	176	300	179	8	27	180	690	870	2,262
% OF NORM	127%	128%	137%	106%	115%	150%	127%	130%	130%
MAY 2011	1,190	1,310	312	147	186	400	3,145	3,545	13,408
NORMAL	1,081	1,245	312	147	186	292	2,971	3,263	10,864
DEPARTURE	109	65	0	0	0	108	174	282	2,544
% OF NORM	110%	105%	100%	100%	100%	137%	106%	109%	123%
JUN 2011	1,740	2,750	423	152	178	350	5,243	5,593	19,001
NORMAL	1,612	2,667	423	152	178	286	5,032	5,318	16,182
DEPARTURE	128	83	0	0	0	64	211	275	2,819
% OF NORM	108%	103%	100%	100%	100%	122%	104%	105%	117%
JUL 2011	895	1,830	179	57	137	240	3,098	3,338	22,339
NORMAL	819	1,776	179	57	137	218	2,968	3,186	19,368
DEPARTURE	76	54	0	0	0	22	130	152	2,971
% OF NORM	109%	103%	100%	100%	100%	110%	104%	105%	115%
AUG 2011	353	604	65	39	115	144	1,176	1,320	23,659
NORMAL	353	604	65	39	115	131	1,176	1,307	20,675
DEPARTURE	0	0	0	0	0	13	0	13	2,984
% OF NORM	100%	100%	100%	100%	100%	110%	100%	101%	114%
SEP 2011	333	452	111	38	111	109	1,045	1,154	24,813
NORMAL	333	452	111	38	111	99	1,045	1,144	21,819
DEPARTURE	0	0	0	0	0	10	0	10	2,994
% OF NORM	100%	100%	100%	100%	100%	110%	100%	101%	114%
OCT 2011	385	523	66	5	120	86	1,099	1,185	25,998
NORMAL	385	523	66	5	120	78	1,099	1,177	22,996
DEPARTURE	0	0	0	0	0	8	0	8	3,002
% OF NORM	100%	100%	100%	100%	100%	110%	100%	101%	113%
NOV 2011	384	398	67	6	118	83	973	1,056	27,054
NORMAL	384	398	67	6	118	76	973	1,049	24,045
DEPARTURE	0	0	0	0	0	7	0	7	3,009
% OF NORM	100%	100%	100%	100%	100%	109%	100%	101%	113%
DEC 2011	329	247	0	12	100	56	688	744	27,798
NORMAL	329	247	0	12	100	52	688	740	24,785
DEPARTURE	0	0	0	0	0	4	0	4	3,013
% OF NORM	100%	100%	100%	100%	100%	108%	100%	101%	112%
				Calendar Year Totals					
	7,795	11,514	2,983	913	1,765	2,828	24,970	27,798	
NORMAL	7,213	10,612	2,373	883	1,681	2,023	22,762	24,785	
DEPARTURE	582	902	610	30	84	805	2,208	3,013	
% OF NORM	108%	108%	126%	103%	105%	140%	110%	112%	

January 5, 2011 Reservoir Monthly Study Call

General Conditions:

1. Past Runoff
   Last month's runoff was 169% of normal.
   Ranging from about 328% in the Sioux City reach to 115% in the Fort Peck reach.
   Last year's runoff was 38.8 MAF – 156% above long-term average (3rd highest in 113 years of record)

2. Current Mountain Snow Pack (May thru July runoff)
   114% of normal – above Ft. Peck
   119% of normal – between Ft. Peck and Garrison
   116% of normal – total above Garrison

   Normally, 42 percent of the peak accumulation has occurred by January 1.

   Current Plains Snow Pack (March and April Runoff)
   Fort Peck, Garrison, and Oahe reaches – moderate snowpack (2" - 3" SWE)
   Big Bend, Fort Randall, and Gavins Point reaches – light snowpack (0" – 2" SWE)
   Gavins to Sioux City Reach – moderate snowpack. (2" – 4" SWE)

3. Forecasted Annual Runoff
   Basic – 27.8 MAF (112% of Normal)
   UB – 38.1 MAF
   LB – 18.6 MAF

4. Gavins Releases
   December - 25.2 kcfs. Extended navigation season…..
   Currently 17.0 kcfs. Will increase to 18.5 kcfs average for Jan and 20.0 kcfs for Feb.

Monthly Studies

1. This Water-Year Balancing – Will end February 2011 with system storage at 56.8 maf.
   Will be unbalanced at the end of February 2011
   Under Basic Condition:
   Fort Peck +0.8 feet, Garrison +0.8 feet and Oahe -1.3 feet.

2. Next Water-Year Balancing – Will be 100% full at Feb 2012 – Basic and upper simulation.
   The 3 reservoirs will be below the base of flood control by the end of Feb 2012 for lower basic.
   Will be balanced for all 3 conditions.

3. Navigation Service Levels
   Basic – Full service levels for entire season.
   Lower Basic – Full service for entire season.
   Upper Basic – Flood control releases all year (including spillway releases.)

4. Navigation Season Lengths
   0 Days shortening for lower basic and basic.
   10 Day extension for upper basic

5. Spring Pulses
   Will have March and May Spring Pulses for all runoff scenarios
   March – 5 kcfs for two days
   May – Basic – 18.3 (10.0) kcfs for two days
   Lower Basic – 12.0 (9.7) kcfs for two days
   Upper Basic – 20.0 (potentially no pulse due to flood control releases).
   * Pulse value shown is based on technical criteria. Pulse value in parentheses is due to downstream flow limits.

6. Energy Generation
   Last year – 8.7 BKWhrs actual – long-term average approx 10.0 BKWhrs
   This year forecast – Basic Simulation – 10.4 BKWhrs

7. Spring Forage Fish Spawn
   Will "favor" Garrison this year if there's not enough water to keep all 3 reservoirs rising
   Basic –All three reservoirs rise during period
   Lower Basic – Only Garrison rises during period
   Upper Basic – All three reservoirs rise during period

JAN 1, 2011 - BASIC CONDITION
END OF FEB 2011 - UNBAL FP +0.8 GA +0.8 OA -1.3
Elevations & Storages are for Date Shown
Avg Discharge & Energy are Monthly Values
Date of Study: January 1, 2011

	31-Dec-10	2011 31-Jan	28-Feb
FORT PECK -------			
ELEV FTMSL	2235.3	2235.0	2234.8
DISCH KCFS	7.8	9.0	9.0
GARRISON --------			
ELEV FTMSL	1841.6	1839.8	1838.3
DISCH KCFS	17.8	24.0	25.0
OAHE ------------			
ELEV FTMSL	1605.0	1605.6	1606.2
DISCH KCFS	24.8	20.5	22.8
BIG BEND --------			
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	20.6	22.8
FORT RANDALL ----			
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	16.4	17.0
GAVINS POINT ----			
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	18.5	20.0
SYSTEM ----------			
STORAGE 1000 AF	57029	56823	56826
ENERGY GWh	1429	729	700
PEAK POWER MW		2311	2317

JAN 1, 2011 - LOWER BASIC
END OF FEB 2011 - UNBAL FP +0.3 GA +0.3 OA -0.5

	31-Dec-10	2011 31-Jan	28-Feb
FORT PECK -------			
ELEV FTMSL	2235.3	2234.5	2234.0
DISCH KCFS	7.8	8.5	8.0
GARRISON --------			
ELEV FTMSL	1841.6	1839.5	1837.5
DISCH KCFS	17.8	24.0	25.0
OAHE ------------			
ELEV FTMSL	1605.0	1605.8	1606.7
DISCH KCFS	24.8	19.4	20.4
BIG BEND --------			
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	19.5	20.4
FORT RANDALL ----			
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	15.3	14.4
GAVINS POINT ----			
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	17.0	17.0
SYSTEM ----------			
STORAGE 1000 AF	57029	56683	56596
ENERGY GWh	1341	699	642
PEAK POWER MW		2311	2316

JAN 1, 2011 - UPPER BASIC
END OF FEB 2011 - UNBAL FP +1.3 GA +1.2 OA -2.1

	31-Dec-10	2011 31-Jan	28-Feb
FORT PECK -------			
ELEV FTMSL	2235.3	2235.2	2235.3
DISCH KCFS	7.8	9.0	9.0
GARRISON --------			
ELEV FTMSL	1841.6	1840.0	1838.7
DISCH KCFS	17.8	24.0	25.0
OAHE ------------			
ELEV FTMSL	1605.0	1605.2	1605.4
DISCH KCFS	24.8	22.6	25.2
BIG BEND --------			
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	22.8	25.2
FORT RANDALL ----			
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	18.6	19.5
GAVINS POINT ----			
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	21.0	23.0
SYSTEM ----------			
STORAGE 1000 AF	57029	56800	56817
ENERGY GWh	1523	775	748
PEAK POWER MW		2310	2314

DATE OF STUDY 01/05/11

JAN 1, 2011 / BASIC CONDITION /
END OF FEB 2011 - UNBAL FP +0.8 GA +0.8 OA -1.3

STUDY NO 1

TIME OF STUDY 08:37:18

VALUES IN 1000 AF EXCEPT AS INDICATED

2011

	31DEC10 INI-SUM	31JAN	2010 28FEB
--FORT PECK--			
NAT INFLOW	686	324	362
DEPLETION	-258	-152	-106
EVAPORATION			
MOD INFLOW	944	476	468
RELEASE	1053	553	500
STOR CHANGE	-109	-77	-32
STORAGE	15074	14997	14965
ELEV FTMSL	2235.3	2235.0	2234.8
DISCH KCFS	7.8	9.0	9.0
POWER			
AVE POWER MW		123	123
PEAK POW MW		163	163
ENERGY GWH	174.2	91.6	82.6
--GARRISON--			
NAT INFLOW	640	280	360
DEPLETION	-126	-76	-50
CHAN STOR	-12	-12	
EVAPORATION			
REG INFLOW	1808	898	910
RELEASE	2864	1476	1388
STOR CHANGE	-1057	-578	-479
STORAGE	19409	18831	18352
ELEV FTMSL	1841.6	1839.8	1838.3
DISCH KCFS	17.8	24.0	25.0
POWER			
AVE POWER MW		303	313
PEAK POW MW		477	471
ENERGY GWH	435.7	225.6	210.1
--OAHE--			
NAT INFLOW	110	15	95
DEPLETION	54	21	33
CHAN STOR	-29	-25	-4
EVAPORATION			
REG INFLOW	2891	1444	1446
RELEASE	2528	1259	1269
STOR CHANGE	363	186	178
STORAGE	18059	18245	18422
ELEV FTMSL	1605.0	1605.6	1606.2
DISCH KCFS	24.8	20.5	22.8
POWER			
AVE POWER MW		261	292
PEAK POW MW		698	701
ENERGY GWH	390.8	194.4	196.4
--BIG BEND--			
EVAPORATION			
REG INFLOW	2528	1259	1269
RELEASE	2538	1269	1269
STORAGE	1631	1621	1621
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	20.6	22.8
POWER			
AVE POWER MW		101	109
PEAK POW MW		538	529
ENERGY GWH	149.0	75.4	73.5
--FORT RANDALL--			
NAT INFLOW	77	27	50
DEPLETION	6	3	3
EVAPORATION			
REG INFLOW	2609	1293	1316
RELEASE	1953	1011	942
STOR CHANGE	656	282	374
STORAGE	2468	2750	3124
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	16.4	17.0
POWER			
AVE POWER MW		125	135
PEAK POW MW		319	339
ENERGY GWH	183.9	93.3	90.6
--GAVINS POINT--			
NAT INFLOW	240	108	132
DEPLETION	1	1	
CHAN STOR	11	12	-1
EVAPORATION			
REG INFLOW	2202	1130	1073
RELEASE	2248	1138	1111
STOR CHANGE	-46	-8	-38
STORAGE	388	380	342
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	18.5	20.0
POWER			
AVE POWER MW		65	70
PEAK POW MW		117	114
ENERGY GWH	95.7	48.7	47.0
--GAVINS POINT - SIOUX CITY--			
NAT INFLOW	280	100	180
DEPLETION	28	14	14
REGULATED FLOW AT SIOUX CITY			
KAF	2500	1224	1277
KCFS		19.9	23.0
--TOTAL--			
NAT INFLOW	2033	854	1179
DEPLETION	-295	-189	-106
CHAN STOR	-30	-25	-5
EVAPORATION			
STORAGE	57029	56823	56826
SYSTEM POWER			
AVE POWER MW		980	1042
PEAK POW MW		2311	2317
ENERGY GWH	1429.3	729.0	700.3
DAILY GWH		23.5	25.0

	INI-SUM	31JAN	28FEB

JAN 1, 2011 - LOWER BASIC
END OF FEB 2011 - UNBAL FP +0.3 GA +0.3 OA -0.5

STUDY NO 2

DATE OF STUDY 01/05/11

VALUES IN 1000 AF EXCEPT AS INDICATED

2011

TIME OF STUDY 08:37:52

	31DEC10 INI-SUM	31JAN	2010 28FEB
--FORT PECK--			
NAT INFLOW	549	259	290
DEPLETION	-142	-86	-56
EVAPORATION			
MOD INFLOW	691	345	346
RELEASE	967	523	444
STOR CHANGE	-276	-178	-98
STORAGE	15074	14896	14798
ELEV FTMSL	2235.3	2234.5	2234.0
DISCH KCFS	7.8	8.5	8.0
POWER		116	109
AVE POWER MW		163	162
PEAK POW MW		86.4	73.3
ENERGY GWH	159.8		
--GARRISON--			
NAT INFLOW	512	224	288
DEPLETION	-88	-54	-34
CHAN STOR	-2	-7	5
EVAPORATION			
REG INFLOW	1565	794	771
RELEASE	2864	1476	1388
STOR CHANGE	-1299	-682	-617
STORAGE	19409	18727	18110
ELEV FTMSL	1841.6	1839.5	1837.5
DISCH KCFS	17.8	24.0	25.0
POWER		303	312
AVE POWER MW		475	468
PEAK POW MW		225.4	209.4
ENERGY GWH	434.8		
--OAHE--			
NAT INFLOW	88	12	76
DEPLETION	54	21	33
CHAN STOR	-29	-25	-4
EVAPORATION			
REG INFLOW	2869	1441	1427
RELEASE	2327	1191	1136
STOR CHANGE	542	250	292
STORAGE	18059	18309	18601
ELEV FTMSL	1605.0	1605.8	1606.7
DISCH KCFS	24.8	19.4	20.4
POWER		248	262
AVE POWER MW		699	704
PEAK POW MW		184.2	176.3
ENERGY GWH	360.5		
--BIG BEND--			
EVAPORATION			
REG INFLOW	2327	1191	1136
RELEASE	2337	1201	1136
STORAGE	1631	1621	1621
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	19.5	20.4
POWER		96	98
AVE POWER MW		538	529
PEAK POW MW		71.4	65.9
ENERGY GWH	137.3		
--FORT RANDALL--			
NAT INFLOW	62	22	40
DEPLETION	6	3	3
EVAPORATION			
REG INFLOW	2393	1220	1173
RELEASE	1737	938	799
STOR CHANGE	656	282	374
STORAGE	2468	2750	3124
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	15.3	14.4
POWER		117	115
AVE POWER MW		319	339
PEAK POW MW		86.7	77.0
ENERGY GWH	163.7		
--GAVINS POINT--			
NAT INFLOW	192	86	106
DEPLETION	1	1	
CHAN STOR	15	14	2
EVAPORATION			
REG INFLOW	1943	1037	906
RELEASE	1989	1045	944
STOR CHANGE	-46	-8	-38
STORAGE	388	380	342
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	17.0	17.0
POWER		60	60
AVE POWER MW		117	114
PEAK POW MW		44.8	40.1
ENERGY GWH	84.9		
--GAVINS POINT - SIOUX CITY--			
NAT INFLOW	224	80	144
DEPLETION	28	14	14
REGULATED FLOW AT SIOUX CITY			
KAF	2185	1111	1074
KCFS		18.1	19.3
--TOTAL--			
NAT INFLOW	1627	683	944
DEPLETION	-141	-101	-40
CHAN STOR	-16	-18	3
EVAPORATION			
STORAGE	57029	56683	56596
SYSTEM POWER		939	955
AVE POWER MW		2311	2316
PEAK POW MW		698.9	642.0
ENERGY GWH	1341.0	22.5	22.9
DAILY GWH			
	INI-SUM	31JAN	28FEB

JAN 1, 2011 - UPPER BASIC
END OF FEB 2011 - UNBAL FP +1.3 GA +1.2 OA -2.1

STUDY NO 3

DATE OF STUDY 01/05/11

TIME OF STUDY 08:36:25

VALUES IN 1000 AF EXCEPT AS INDICATED

2011

	31DEC10 INI-SUM	31JAN	2010 28FEB
--FORT PECK--			
NAT INFLOW	823	389	434
DEPLETION	-219	-130	-89
EVAPORATION			
MOD INFLOW	1042	519	523
RELEASE	1053	553	500
STOR CHANGE	-11	-34	23
STORAGE	15074	15040	15063
ELEV FTMSL	2235.3	2235.2	2235.3
DISCH KCFS	7.8	9.0	9.0
POWER		123	123
AVE POWER MW		163	163
PEAK POW MW			
ENERGY GWH	174.3	91.6	82.7
--GARRISON--			
NAT INFLOW	768	336	432
DEPLETION	-131	-82	-49
CHAN STOR	-12	-12	
EVAPORATION			
REG INFLOW	1941	960	981
RELEASE	2864	1476	1388
STOR CHANGE	-924	-516	-408
STORAGE	19409	18893	18485
ELEV FTMSL	1841.6	1840.0	1838.7
DISCH KCFS	17.8	24.0	25.0
POWER		303	313
AVE POWER MW		477	473
PEAK POW MW			
ENERGY GWH	436.1	225.7	210.5
--OAHE--			
NAT INFLOW	132	18	114
DEPLETION	54	21	33
CHAN STOR	-29	-25	-4
EVAPORATION			
REG INFLOW	2913	1447	1465
RELEASE	2790	1390	1400
STOR CHANGE	123	58	65
STORAGE	18059	18117	18182
ELEV FTMSL	1605.0	1605.2	1605.4
DISCH KCFS	24.8	22.6	25.2
POWER		288	321
AVE POWER MW		695	697
PEAK POW MW			
ENERGY GWH	430.0	214.2	215.8
--BIG BEND--			
EVAPORATION			
REG INFLOW	2790	1390	1400
RELEASE	2800	1400	1400
STORAGE	1631	1621	1621
ELEV FTMSL	1420.2	1420.0	1420.0
DISCH KCFS	22.4	22.8	25.2
POWER		112	121
AVE POWER MW		538	529
PEAK POW MW			
ENERGY GWH	164.2	83.1	81.1
--FORT RANDALL--			
NAT INFLOW	92	32	60
DEPLETION	6	3	3
EVAPORATION			
REG INFLOW	2886	1429	1457
RELEASE	2230	1147	1083
STOR CHANGE	656	282	374
STORAGE	2468	2750	3124
ELEV FTMSL	1340.5	1344.8	1350.0
DISCH KCFS	22.8	18.6	19.5
POWER		142	155
AVE POWER MW		319	339
PEAK POW MW			
ENERGY GWH	209.6	105.6	104.0
--GAVINS POINT--			
NAT INFLOW	288	130	158
DEPLETION	1	1	
CHAN STOR	6	8	-2
EVAPORATION			
REG INFLOW	2523	1283	1239
RELEASE	2569	1291	1277
STOR CHANGE	-46	-8	-38
STORAGE	388	380	342
ELEV FTMSL	1207.8	1207.5	1206.0
DISCH KCFS	25.2	21.0	23.0
POWER		74	80
AVE POWER MW		117	114
PEAK POW MW			
ENERGY GWH	108.9	55.1	53.8
--GAVINS POINT - SIOUX CITY--			
NAT INFLOW	336	120	216
DEPLETION	28	14	14
REGULATED FLOW AT SIOUX CITY			
KAF	2877	1397	1479
KCFS		22.7	26.6
--TOTAL--			
NAT INFLOW	2439	1025	1414
DEPLETION	-261	-173	-88
CHAN STOR	-35	-29	-6
EVAPORATION			
STORAGE	57029	56800	56817
SYSTEM POWER		1042	1113
AVE POWER MW		2310	2314
PEAK POW MW			
ENERGY GWH	1523.2	775.3	747.9
DAILY GWH		25.0	26.7

	INI-SUM	31JAN	28FEB

JAN 1, 2011 / BASIC CONDITION / 27.8 MAF / BALANCED
FULL SERV / SHTN NAV SEAS 0 DAYS / PULSE MAR 5.0 MAY 18.3 (CALC)
Elevations & Storages are for Date Shown
Avg Discharge & Energy are Monthly Values
Date of Study: January 1, 2011

	28-Feb-11	31-Mar	2011 30-Apr	31-May	30-Jun	31-Jul	31-Aug	30-Sep	31-Oct	30-Nov	31-Dec	2012 31-Jan	29FEB
FORT PECK ELEV FTMSL	2234.8	2236.6	2238.1	2238.8	2241.0	2240.5	2238.4	2237.3	2237.1	2237.2	2236.0	2234.9	2234.0
DISCH KCFS	9.0	6.0	8.0	12.0	12.0	12.0	12.0	8.9	6.0	6.0	11.0	11.5	11.5
GARRISON ELEV FTMSL	1838.3	1840.4	1842.0	1842.7	1845.4	1845.6	1843.5	1842.3	1841.5	1840.9	1840.2	1838.7	1837.5
DISCH KCFS	25.0	18.0	22.0	26.0	30.0	30.0	30.0	24.2	18.0	18.0	19.0	25.0	25.0
OAHE ELEV FTMSL	1606.2	1608.5	1610.6	1611.3	1612.6	1612.6	1611.8	1610.3	1609.3	1607.7	1606.7	1606.9	1607.5
DISCH KCFS	22.8	22.0	20.7	25.9	26.7	29.7	32.2	31.6	23.4	26.1	22.6	23.7	22.7
BIG BEND ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	22.8	22.0	20.7	25.9	26.7	29.6	31.9	31.2	23.1	25.8	22.4	23.7	22.7
FORT RANDALL ELEV FTMSL	1350.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	17.0	18.7	23.2	28.1	29.0	30.1	31.9	33.7	33.2	33.3	20.7	18.3	17.0
GAVINS POINT ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	20.0	22.6	26.7	30.7	31.6	31.6	33.2	35.0	35.0	35.0	22.5	20.0	20.0
SYSTEM STORAGE 1000 AF	56826	59018	60544	61163	63038	63013	61533	60295	58993	57859	57168	56842	56823
ENERGY GWh	10543	692	751	962	988	1070	1114	999	826	820	759	816	746
PEAK POWER MW		2335	2354	2368	2382	2381	2375	2362	2338	2294	2255	2275	2282

JAN 1, 2011 LOWER BASIC / 18.6 MAF / BALANCED
FULL SERV / SHTN NAV SEAS 0 DAYS / PULSE MAR 5.0 MAY 12.0 (CALC)

	28-Feb-11	31-Mar	2011 30-Apr	31-May	30-Jun	31-Jul	31-Aug	30-Sep	31-Oct	30-Nov	31-Dec	2012 31-Jan	29FEB
FORT PECK ELEV FTMSL	2234.0	2234.5	2234.6	2233.9	2234.1	2232.5	2230.4	2229.3	2228.9	2228.4	2226.7	2225.0	2223.6
DISCH KCFS	8.0	6.0	8.0	11.0	10.0	10.0	10.0	7.8	6.0	6.0	10.0	10.5	10.5
GARRISON ELEV FTMSL	1837.5	1838.4	1839.2	1839.5	1840.4	1839.5	1837.6	1836.3	1835.2	1834.4	1833.0	1830.7	1828.8
DISCH KCFS	25.0	16.0	18.0	20.0	24.0	24.0	24.0	20.2	16.0	16.3	19.0	25.0	25.0
OAHE ELEV FTMSL	1606.7	1607.2	1606.9	1605.0	1603.8	1601.4	1598.7	1596.1	1594.6	1593.6	1594.7	1596.5	1598.6
DISCH KCFS	20.4	23.7	25.9	31.3	31.6	33.7	33.6	30.8	22.1	19.4	13.2	16.6	15.9
BIG BEND ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	20.4	23.7	25.9	31.3	31.6	33.6	33.2	30.3	21.7	19.0	13.0	16.6	15.9
FORT RANDALL ELEV FTMSL	1350.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	14.4	19.2	27.5	32.5	32.9	33.7	33.0	32.5	31.7	26.4	11.3	11.2	10.0
GAVINS POINT ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.0	21.4	29.8	33.9	34.3	34.3	34.0	33.5	33.1	28.1	12.5	12.5	12.5
SYSTEM STORAGE 1000 AF	56596	57550	57735	57086	57074	55750	53950	52526	51066	50041	49681	49518	49625
ENERGY GWh	9611	694	807	988	988	1049	1036	904	756	649	533	632	575
PEAK POWER MW		2320	2321	2312	2309	2292	2270	2256	2233	2192	2160	2184	2195

JAN 1, 2011 / UPPER BASIC / 38.1 MAF / BALANCED
FULL SERV / EXTENDED SEAS / PULSE MAR 5.0 MAY 20.0 (CALCULATED)

	28-Feb-11	31-Mar	2011 30-Apr	31-May	30-Jun	31-Jul	31-Aug	30-Sep	31-Oct	30-Nov	31-Dec	2012 31-Jan	29FEB
FORT PECK ELEV FTMSL	2235.3	2237.5	2240.4	2242.8	2248.8	2249.4	2246.6	2243.9	2241.2	2238.6	2236.9	2235.3	2234.0
DISCH KCFS	9.0	8.0	8.0	14.0	14.0	14.0	18.0	18.1	18.0	18.0	14.0	14.0	14.0
GARRISON ELEV FTMSL	1838.7	1842.6	1844.8	1845.1	1850.5	1851.0	1848.4	1846.0	1843.2	1840.9	1840.7	1838.9	1837.5
DISCH KCFS	25.0	18.0	26.0	40.0	42.0	42.0	42.0	42.1	42.0	42.0	22.0	30.0	30.0
OAHE ELEV FTMSL	1605.4	1609.4	1612.2	1613.0	1614.2	1612.4	1609.8	1608.0	1607.7	1607.0	1606.1	1606.5	1607.5
DISCH KCFS	25.2	19.1	24.1	40.4	43.9	52.9	54.3	51.8	43.8	46.2	27.1	27.2	26.1
BIG BEND ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	25.2	19.1	24.1	40.4	43.9	52.8	54.0	51.5	43.5	46.1	27.0	27.2	26.1
FORT RANDALL ELEV FTMSL	1350.0	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	19.5	17.2	27.5	43.6	47.7	53.7	54.2	54.2	53.8	53.8	25.4	22.0	20.6
GAVINS POINT ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	23.0	22.6	32.0	47.0	52.0	56.0	56.0	56.0	56.0	56.0	28.0	24.0	24.0
SYSTEM STORAGE 1000 AF	56817	60208	62565	63478	67262	67002	64486	62301	59987	57972	57322	56891	56833
ENERGY GWh	14298	666	871	1369	1386	1542	1549	1465	1407	1354	885	942	861
PEAK POWER MW		2355	2378	2383	2396	2386	2370	2362	2344	2287	2254	2274	2282

DATE OF STUDY 01/05/11 JAN 1, 2011 / BASIC CONDITION / 27.8 MAF / BALANCED STUDY NO 6

TIME OF STUDY 08:37:18 FULL SERV / SHTN NAV SEAS 0 DAYS / PULSE MAR 5.0 MAY 18.3 (CALC)

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB11	2011											2012			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	7781	327	152	196	825	1190	1740	895	353	333	385	192	90	102	329	312	360
DEPLETION	418	-36	-17	-21	25	298	525	234	11	-75	-42	-41	-19	-22	-132	-153	-118
EVAPORATION	468							29	91	112	98	44	21	24	51		
MOD INFLOW	6895	363	169	217	800	892	1215	632	251	296	329	188	88	100	410	465	478
RELEASE	7071	179	83	107	476	738	714	738	738	527	369	179	83	95	676	707	661
STOR CHANGE	-176	184	86	110	324	154	501	-106	-486	-231	-39	10	5	5	-266	-242	-183
STORAGE	14965	15149	15235	15345	15669	15823	16324	16218	15732	15500	15461	15471	15475	15480	15214	14972	14789
ELEV FTMSL	2234.8	2235.7	2236.1	2236.6	2238.1	2238.8	2241.0	2240.5	2238.4	2237.3	2237.1	2237.2	2237.2	2237.2	2236.0	2234.9	2234.0
DISCH KCFS	9.0	6.0	6.0	6.0	8.0	12.0	12.0	12.0	12.0	8.9	6.0	6.0	6.0	6.0	11.0	11.5	11.5
POWER		82	82	82	110	162	163	164	163	122	83	83	83	83	149	154	153
AVE POWER MW		163	164	164	165	166	167	167	165	165	165	165	165	165	164	163	162
PEAK POW MW		29.6	13.8	17.8	79.3	120.5	117.4	121.8	121.1	87.9	61.5	29.8	13.9	15.9	110.9	114.7	106.8
ENERGY GWH	1162.8																
--GARRISON--																	
NAT INFLOW	11491	668	312	401	1380	1310	2750	1830	604	452	523	199	93	106	247	261	356
DEPLETION	989	4	2	3	-3	177	765	602	107	-142	-25	-121	-56	-65	-115	-87	-57
CHAN STOR	-24	30			-20	-39				30	28				-49	-5	
EVAPORATION	540							34	105	130	112	50	23	27	58		
REG INFLOW	17008	872	393	505	1839	1832	2699	1932	1129	1021	832	448	209	239	932	1050	1074
RELEASE	17249	536	250	321	1309	1599	1785	1845	1845	1438	1107	536	250	286	1168	1537	1438
STOR CHANGE	-241	336	143	184	530	233	914	87	-715	-417	-274	-87	-41	-47	-236	-487	-364
STORAGE	18352	18689	18831	19015	19546	19779	20693	20780	20065	19648	19373	19286	19245	19199	18962	18475	18112
ELEV FTMSL	1838.3	1839.3	1839.8	1840.4	1842.0	1842.7	1845.4	1845.6	1843.5	1842.3	1841.5	1841.2	1841.1	1840.9	1840.2	1838.7	1837.5
DISCH KCFS	25.0	18.0	18.0	18.0	22.0	26.0	30.0	30.0	30.0	24.2	18.0	18.0	18.0	18.0	19.0	25.0	25.0
POWER		226	227	227	278	330	383	386	385	308	229	228	228	228	240	313	311
AVE POWER MW		475	477	479	485	495	500	500	499	490	482	481	481	480	478	472	468
PEAK POW MW		81.2	38.1	49.1	200.3	245.5	276.1	287.5	286.1	221.7	170.2	82.1	38.3	43.7	178.7	233.2	216.3
ENERGY GWH	2648.2																
--OAHE--																	
NAT INFLOW	2975	479	223	287	660	312	423	179	65	111	66	34	16	18	12	12	90
DEPLETION	681	24	11	14	49	71	145	173	116	28	-10	1	0	1	-4	18	28
CHAN STOR	0	28			-16	-15	-15			22	24					-24	
EVAPORATION	533							33	104	130	111	50	23	26	56		
REG INFLOW	19010	1019	462	594	1904	1824	2048	1817	1689	1414	1095	518	242	277	1097	1507	1500
RELEASE	18596	652	304	396	1234	1592	1588	1824	1980	1883	1440	687	354	512	1387	1454	1308
STOR CHANGE	414	367	158	198	671	232	460	-7	-291	-469	-345	-169	-112	-235	-291	53	192
STORAGE	18422	18790	18948	19146	19817	20049	20509	20503	20212	19743	19398	19229	19117	18882	18592	18645	18837
ELEV FTMSL	1606.2	1607.4	1607.9	1608.5	1610.6	1611.3	1612.6	1612.6	1611.8	1610.3	1609.3	1608.8	1608.4	1607.7	1606.7	1606.9	1607.5
DISCH KCFS	22.8	21.9	21.9	22.2	20.7	25.9	26.7	29.7	32.2	31.6	23.4	23.1	25.5	32.2	22.6	23.7	22.7
POWER		282	283	287	271	340	352	392	424	415	306	300	331	416	291	304	293
AVE POWER MW		707	710	713	724	728	735	735	730	723	717	714	713	709	704	705	708
PEAK POW MW		101.4	47.5	62.1	194.8	252.8	253.4	291.8	315.8	298.6	227.6	108.2	55.5	79.9	216.3	226.2	204.0
ENERGY GWH	2935.9																
--BIG BEND--																	
EVAPORATION	103							6	20	25	22	10	5	5	11		
REG INFLOW	18492	652	304	396	1234	1592	1588	1818	1961	1858	1419	677	349	506	1376	1454	1308
RELEASE	18492	652	304	396	1234	1592	1588	1818	1961	1858	1419	677	349	506	1376	1454	1308
STORAGE	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	22.8	21.9	21.9	22.2	20.7	25.9	26.7	29.6	31.9	31.2	23.1	22.8	25.2	31.9	22.4	23.7	22.7
POWER		104	102	104	97	121	125	138	149	148	113	114	126	159	112	116	109
AVE POWER MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
PEAK POW MW		37.4	17.2	22.4	69.9	90.2	89.9	103.0	111.0	106.5	84.1	41.1	21.2	30.5	83.5	86.2	75.8
ENERGY GWH	1069.8																
--FORT RANDALL--																	
NAT INFLOW	910	110	51	66	152	147	152	57	39	38	5	3	1	2	12	25	49
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	117							8	25	31	25	9	4	4	10		
REG INFLOW	19206	761	355	461	1382	1730	1728	1849	1959	1858	1398	670	346	502	1376	1476	1354
RELEASE	19207	470	221	461	1382	1730	1728	1849	1959	2004	2041	991	462	528	1274	1126	980
STOR CHANGE	-1	291	134					0	0	-146	-643	-321	-116	-26	102	350	374
STORAGE	3124	3415	3549	3549	3549	3549	3549	3549	3549	3403	2760	2439	2323	2297	2399	2749	3123
ELEV FTMSL	1350.0	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	17.0	15.8	15.9	25.8	23.2	28.1	29.0	30.1	31.9	33.7	33.2	33.3	33.3	33.3	20.7	18.3	17.0
POWER		130	134	218	196	237	245	253	268	281	265	251	243	240	152	139	135
AVE POWER MW		351	356	356	356	356	356	356	356	350	319	296	287	285	293	319	339
PEAK POW MW		47.0	22.5	47.1	141.3	176.4	176.1	188.3	199.4	202.3	197.4	90.3	40.8	46.1	112.8	103.2	94.3
ENERGY GWH	1885.4																
--GAVINS POINT--																	
NAT INFLOW	1755	122	57	73	207	186	178	137	115	111	120	59	28	31	100	100	130
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	0	-19	5	-9	-2	-2	-3	-3	1	0	0	0	23	4	2
EVAPORATION	36							2	6	9	8	3	2	2	4		
REG INFLOW	20811	595	278	516	1589	1888	1880	1943	2054	2108	2152	1041	486	555	1383	1230	1112
RELEASE	20811	595	278	516	1589	1888	1880	1943	2041	2083	2152	1041	486	555	1383	1230	1150
STOR CHANGE									13	25							-38
STORAGE	342	342	342	342	342	342	342	342	355	380	380	380	380	380	380	380	342
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	20.0	20.0	20.0	28.9	26.7	30.7	31.6	31.6	33.2	35.0	35.0	35.0	35.0	35.0	22.5	20.0	20.0
POWER		69	69	98	91	103	105	105	109	114	115	115	115	115	76	70	69
AVE POWER MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
PEAK POW MW		24.8	11.6	21.2	65.6	76.3	75.3	77.8	80.9	82.1	85.5	41.4	19.3	22.1	56.7	52.0	48.3
ENERGY GWH	840.8																
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	2680	261	122	157	540	400	350	240	144	109	86	42	19	22	56	40	92
DEPLETION	266	7	3	4	22	36	31	39	36	24	11	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	23225	850	397	669	2107	2252	2199	2144	2149	2168	2227	1077	503	574	1426	1256	1228
KCFS		28.6	28.6	37.5	35.4	36.6	37.0	34.9	35.0	36.4	36.2	36.2	36.2	36.2	23.2	20.4	21.4
--TOTAL--																	
NAT INFLOW	27592	1968	918	1180	3764	3545	5593	3338	1320	1154	1185	528	246	282	744	750	1077
DEPLETION	2548	0	0	0	102	610	1502	1105	295	-163	-63	-149	-69	-79	-209	-204	-130
CHAN STOR	-26	60	0	-19	-30	-64	-17	-2	-3	49	52	0	0	-1	-28	-24	2
EVAPORATION	1797							112	352	437	375	167	77	88	189		
STORAGE	56826	58005	58526	59018	60544	61163	63038	63013	61533	60295	58993	58425	58161	57859	57168	56842	56823
SYSTEM POWER		893	897	1017	1043	1293	1373	1439	1498	1388	1111	1091	1125	1240	1020	1096	1071
AVE POWER MW		2328	2330	2335	2354	2368	2382	2381	2375	2362	2338	2311	2300	2294	2255	2275	2282
PEAK POW MW		321.4	150.8	219.8	751.2	961.7	988.3	1070.3	1114.3	999.1	826.3	392.8	189.0	238.2	758.8	815.5	745.5
ENERGY GWH	10542.9																
DAILY GWH		21.4	21.5	24.4	25.0	31.0	32.9	34.5	35.9	33.3	26.7	26.2	27.0	29.8	24.5	26.3	25.7

	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

DATE OF STUDY 01/05/11 — JAN 1, 2011 LOWER BASIC / 18.6 MAF / BALANCED — STUDY NO 8

TIME OF STUDY 08:37:52 — FULL SERV / SHTN NAV SEAS 0 DAYS / PULSE MAR 5.0 MAY 12.0 (CALC)

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB11		2011										2012			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	5234	212	99	127	536	714	1044	537	282	266	308	154	72	82	263	250	288
DEPLETION	373	-17	-8	-10	38	195	405	219	1	-108	-90	-24	-11	-13	-80	-69	-55
EVAPORATION	533							33	103	128	111	50	23	27	57		
MOD INFLOW	4328	229	107	138	498	519	639	285	178	246	287	127	60	68	286	319	343
RELEASE	6401	179	83	107	476	676	595	615	615	464	369	179	83	95	615	646	604
STOR CHANGE	-2073	51	24	30	22	-157	44	-330	-437	-218	-82	-51	-24	-27	-329	-327	-261
STORAGE	14798	14849	14873	14903	14925	14768	14812	14481	14044	13826	13744	13693	13669	13642	13313	12987	12726
ELEV FTMSL	2234.0	2234.3	2234.4	2234.5	2234.6	2233.9	2234.1	2232.5	2230.4	2229.3	2228.9	2228.6	2228.5	2228.4	2226.7	2225.0	2223.6
DISCH KCFS	8.0	6.0	6.0	6.0	8.0	11.0	10.0	10.0	10.0	7.8	6.0	6.0	6.0	6.0	10.0	10.5	10.5
POWER		82	82	82	109	148	136	136	135	105	81	81	81	80	133	138	137
AVE POWER MW		162	163	163	163	162	162	161	160	159	158	158	158	158	157	155	154
PEAK POW MW		29.5	13.8	17.7	78.7	109.9	97.9	100.9	100.3	75.6	60.0	29.0	13.5	15.5	99.1	102.5	95.2
ENERGY GWH	1038.9																
--GARRISON--																	
NAT INFLOW	7601	434	202	260	897	786	1650	1098	483	362	418	159	74	85	198	209	285
DEPLETION	933	15	7	9	21	111	524	493	111	-107	20	-93	-43	-50	-52	-22	-12
CHAN STOR	-25	20			-20	-30	10			22	18				-40	-5	
EVAPORATION	618							39	121	149	128	57	27	30	65		
REG INFLOW	12426	617	279	358	1332	1322	1731	1181	866	806	657	373	174	199	759	872	901
RELEASE	14959	476	222	286	1071	1230	1428	1476	1476	1200	984	476	222	270	1168	1537	1438
STOR CHANGE	-2533	141	56	73	261	92	303	-295	-610	-394	-327	-103	-48	-71	-409	-666	-537
STORAGE	18110	18251	18307	18380	18641	18733	19036	18741	18131	17737	17410	17307	17259	17188	16779	16114	15577
ELEV FTMSL	1837.5	1838.0	1838.1	1838.4	1839.2	1839.5	1840.4	1839.5	1837.6	1836.3	1835.2	1834.8	1834.7	1834.4	1833.0	1830.7	1828.8
DISCH KCFS	25.0	16.0	16.0	16.0	18.0	20.0	24.0	24.0	24.0	20.2	16.0	16.0	16.0	17.0	19.0	25.0	25.0
POWER		199	200	200	225	251	302	302	299	249	197	196	196	208	231	299	295
AVE POWER MW		470	470	471	474	475	479	476	468	464	460	458	458	457	452	443	436
PEAK POW MW		71.8	33.6	43.2	162.4	186.8	217.4	224.6	222.7	179.6	146.6	70.6	32.9	39.9	171.5	222.3	205.1
ENERGY GWH	2230.8																
--OAHE--																	
NAT INFLOW	1951	312	145	187	429	187	254	107	52	89	53	27	13	14	12	10	72
DEPLETION	681	24	11	14	49	71	145	173	116	28	-10	1	0	1	-9	18	28
CHAN STOR	-2	36			-8	-8	-16			17	19			-5	-27		
EVAPORATION	549							36	109	133	113	50	23	27	58		
REG INFLOW	15679	800	356	458	1443	1338	1521	1374	1302	1145	953	452	211	252	1089	1502	1482
RELEASE	18043	647	300	513	1541	1922	1880	2072	2069	1835	1361	586	308	259	814	1023	913
STOR CHANGE	-2364	153	56	-55	-98	-584	-359	-698	-766	-691	-409	-134	-98	-6	275	479	569
STORAGE	18601	18754	18811	18755	18657	18073	17714	17016	16250	15560	15151	15017	14919	14913	15188	15667	16237
ELEV FTMSL	1606.7	1607.2	1607.4	1607.2	1606.9	1605.0	1603.8	1601.4	1598.7	1596.1	1594.6	1594.0	1593.7	1593.6	1594.7	1596.5	1598.6
DISCH KCFS	20.4	21.7	21.6	28.8	25.9	31.3	31.6	33.7	33.6	30.8	22.1	19.7	22.2	16.3	13.2	16.6	15.9
POWER		280	279	370	333	399	400	422	415	376	267	237	266	196	159	201	194
AVE POWER MW		706	707	706	705	695	688	676	661	649	641	639	637	637	642	651	661
PEAK POW MW		100.7	46.9	80.0	239.9	296.9	287.8	313.9	309.0	270.4	198.9	85.2	44.7	37.5	118.6	149.9	135.3
ENERGY GWH	2715.5																
--BIG BEND--																	
EVAPORATION	129							8	24	31	27	12	6	7	14		
REG INFLOW	17914	647	300	513	1541	1922	1880	2064	2044	1804	1334	574	303	252	800	1023	913
RELEASE	17914	647	300	513	1541	1922	1880	2064	2044	1804	1334	574	303	252	800	1023	913
STORAGE	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	20.4	21.7	21.6	28.8	25.9	31.3	31.6	33.6	33.2	30.3	21.7	19.3	21.8	15.9	13.0	16.6	15.9
POWER		103	101	135	121	146	148	157	156	144	106	97	109	80	66	82	76
AVE POWER MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
PEAK POW MW		37.1	17.0	29.1	87.3	108.8	106.4	116.9	115.7	103.5	79.1	34.9	18.4	15.4	48.9	60.8	53.0
ENERGY GWH	1032.3																
--FORT RANDALL--																	
NAT INFLOW	599	72	33	43	99	88	91	34	31	30	4	3	1	1	10	20	39
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	146							10	32	39	31	12	5	5	12		
REG INFLOW	18287	717	333	556	1636	2001	1959	2070	2028	1788	1306	563	298	248	795	1040	949
RELEASE	18288	426	199	556	1636	2001	1959	2070	2028	1934	1949	884	414	274	692	690	575
STOR CHANGE	0	291	134	0	0			0	0	-146	-643	-321	-116	-26	103	350	374
STORAGE	3124	3415	3549	3549	3549	3549	3549	3549	3549	3403	2760	2439	2323	2297	2400	2750	3124
ELEV FTMSL	1350.0	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	14.4	14.3	14.3	31.1	27.5	32.5	32.9	33.7	33.0	32.5	31.7	29.7	29.9	17.3	11.3	11.2	10.0
POWER		118	121	262	232	274	277	283	277	271	254	224	218	126	83	85	80
AVE POWER MW		351	356	356	356	356	356	356	356	350	319	296	287	285	293	319	339
PEAK POW MW		42.6	20.3	56.6	166.9	203.6	199.2	210.4	206.3	195.4	188.7	80.7	36.7	24.2	61.8	63.6	55.6
ENERGY GWH	1812.5																
--GAVINS POINT--																	
NAT INFLOW	1235	79	37	48	135	112	107	82	92	89	96	47	22	25	80	80	104
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	7	0	0	-32	7	-10	-1	-1	1	1	1	4	0	23	11	0	2
EVAPORATION	45							3	8	11	10	4	2	2	5		
REG INFLOW	19371	506	236	571	1773	2084	2041	2109	2104	2018	2035	925	432	317	769	769	681
RELEASE	19371	506	236	571	1773	2084	2041	2109	2091	1993	2035	925	432	317	769	769	719
STOR CHANGE									13	25							-38
STORAGE	342	342	342	342	342	342	342	342	355	380	380	380	380	380	380	380	342
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.0	17.0	17.0	32.0	29.8	33.9	34.3	34.3	34.0	33.5	33.1	31.1	31.1	20.0	12.5	12.5	12.5
POWER		59	59	106	100	110	111	111	110	111	111	106	106	71	44	44	44
AVE POWER MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
PEAK POW MW		21.2	9.9	22.8	72.3	81.6	79.6	82.2	82.1	79.8	82.5	38.3	17.9	13.5	33.0	33.0	30.7
ENERGY GWH	780.4																
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1784	170	79	102	351	240	210	144	115	87	69	33	15	18	45	32	74
DEPLETION	266	7	3	4	22	36	31	39	36	24	11	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	20889	669	312	669	2102	2288	2220	2214	2170	2056	2093	952	444	332	801	787	779
KCFS		22.5	22.5	37.5	35.3	37.2	37.3	36.0	35.3	34.6	34.0	32.0	32.0	20.9	13.0	12.8	13.5
--TOTAL--																	
NAT INFLOW	18404	1279	597	767	2447	2127	3356	2002	1055	923	948	422	197	225	596	601	862
DEPLETION	2447	30	14	18	139	441	1141	981	289	-161	-66	-104	-49	-55	-94	-55	-22
CHAN STOR	-20	56	0	-32	-21	-47	-7	-1	1	39	38	3	0	19	-38	-32	2
EVAPORATION	2019							129	398	491	419	186	86	98	212		
STORAGE	56596	57232	57502	57550	57735	57086	57074	55750	53950	52526	51066	50456	50171	50041	49681	49518	49625
SYSTEM POWER		841	842	1154	1121	1327	1373	1410	1393	1256	1016	941	976	760	716	850	826
AVE POWER MW		2321	2320	2320	2321	2312	2309	2292	2270	2256	2233	2206	2195	2192	2160	2184	2195
PEAK POW MW		302.9	141.5	249.3	807.4	987.6	988.3	1048.9	1036.2	904.1	755.8	338.7	164.0	145.9	532.9	632.1	574.9
ENERGY GWH	9610.4																
DAILY GWH		20.2	20.2	27.7	26.9	31.9	32.9	33.8	33.4	30.1	24.4	22.6	23.4	18.2	17.2	20.4	19.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

DATE OF STUDY 01/05/11 — JAN 1, 2011 UPPER BASIC / 38.1 MAF / BALANCED — STUDY NO 5

TIME OF STUDY 08:36:25 — FULL SERV / EXTENDED SEAS / PULSE MAR 5.0 MAY 20.0 (CALC)

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB11		2011										2012				
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	10676	441	206	264	1114	1666	2784	1253	424	400	462	231	108	123	395	374	432
DEPLETION	191	-24	-11	-14	-23	260	513	204	-62	-129	-89	-30	-14	-16	-123	-146	-105
EVAPORATION	341							23	74	91	78	18	8	9	39		
MOD INFLOW	10144	465	217	279	1137	1406	2271	1026	412	438	473	242	113	129	479	520	537
RELEASE	10414	238	111	143	476	861	833	861	1107	1079	1107	536	250	286	861	861	805
STOR CHANGE	-270	227	106	136	661	545	1438	165	-695	-642	-634	-293	-137	-156	-381	-341	-268
STORAGE	15063	15289	15395	15531	16192	16737	18175	18340	17645	17003	16369	16076	15940	15783	15402	15061	14793
ELEV FTMSL	2235.3	2236.3	2236.8	2237.5	2240.4	2242.8	2248.8	2249.4	2246.6	2243.9	2241.2	2239.9	2239.3	2238.6	2236.9	2235.3	2234.0
DISCH KCFS	9.0	8.0	8.0	8.0	8.0	14.0	14.0	14.0	18.0	18.1	18.0	18.0	18.0	18.0	14.0	14.0	14.0
POWER																	
AVE POWER MW		110	110	110	111	168	171	173	172	170	168	166	166	165	165	164	163
PEAK POW MW		164	164	165	167	169	173	173	171	169	167	166	166	165	164	163	162
ENERGY GWH	1390.0	39.5	18.5	23.8	79.7	124.7	122.9	128.8	127.9	122.3	124.9	59.9	27.8	31.7	122.6	121.7	113.1
--GARRISON--																	
NAT INFLOW	15931	902	421	541	1863	1834	4400	2562	725	542	628	239	112	127	296	313	427
DEPLETION	997	4	2	3	18	100	802	621	93	-133		-118	-55	-63	-117	-96	-64
CHAN STOR	-46	10				-58			-37	-1	1				39		
EVAPORATION	386							27	84	104	88	20	9	11	44		
REG INFLOW	24915	1145	530	681	2321	2537	4431	2775	1617	1650	1648	872	407	465	1269	1270	1296
RELEASE	25286	536	250	321	1547	2460	2499	2583	2583	2504	2583	1250	583	666	1353	1845	1726
STOR CHANGE	-371	610	280	360	774	78	1932	192	-965	-854	-934	-377	-176	-201	-83	-575	-429
STORAGE	18485	19095	19375	19734	20508	20586	22518	22710	21745	20891	19957	19579	19403	19202	19119	18544	18115
ELEV FTMSL	1838.7	1840.6	1841.5	1842.6	1844.8	1845.1	1850.5	1851.0	1848.4	1846.0	1843.2	1842.1	1841.6	1840.9	1840.7	1838.9	1837.5
DISCH KCFS	25.0	18.0	18.0	18.0	26.0	40.0	42.0	42.0	42.0	42.1	42.0	42.0	42.0	42.0	22.0	30.0	30.0
POWER																	
AVE POWER MW		227	228	229	332	497	502	504	503	501	499	493	484	481	278	376	372
PEAK POW MW		480	482	493	499	500	504	504	502	500	498	486	483	480	480	473	468
ENERGY GWH	3718.1	81.6	38.3	49.4	239.3	369.5	361.2	375.0	374.3	360.9	371.4	177.6	81.2	92.4	206.9	279.8	259.2
--OAHE--																	
NAT INFLOW	4085	647	302	388	891	437	677	251	78	133	79	40	19	21	14		108
DEPLETION	681	24	11	14	49	71	145	173	116	28	-10	1	0	1	12	18	28
CHAN STOR	-15	28			-31	-53	-7			0	0				80	-32	
EVAPORATION	359							25	77	94	81	19	9	10	42		
REG INFLOW	28316	1187	541	695	2358	2773	3024	2635	2467	2514	2591	1269	592	677	1379	1808	1806
RELEASE	27660	562	266	347	1435	2483	2610	3252	3336	3083	2693	1286	634	831	1667	1673	1502
STOR CHANGE	657	625	274	348	923	290	414	-617	-869	-569	-102	-16	-41	-154	-288	135	304
STORAGE	18182	18808	19082	19430	20353	20643	21057	20440	19571	19003	18900	18884	18842	18688	18400	18535	18839
ELEV FTMSL	1605.4	1607.4	1608.3	1609.4	1612.2	1613.0	1614.2	1612.4	1609.8	1608.0	1607.7	1607.7	1607.5	1607.0	1606.1	1606.5	1607.5
DISCH KCFS	25.2	18.9	19.2	19.4	24.1	40.4	43.9	52.9	54.3	51.8	43.8	43.2	45.6	52.4	27.1	27.2	26.1
POWER																	
AVE POWER MW		243	248	253	316	532	580	683	688	655	562	554	585	655	348	348	336
PEAK POW MW		707	712	718	732	737	743	734	720	711	709	709	708	705	700	703	708
ENERGY GWH	4310.3	87.4	41.7	54.6	227.8	395.7	417.7	508.4	512.0	471.4	418.4	199.6	98.2	125.7	258.7	259.3	233.7
--BIG BEND--																	
EVAPORATION	71							5	15	19	16	4	2	2	9		
REG INFLOW	27589	562	266	347	1435	2483	2610	3247	3321	3064	2677	1282	632	829	1659	1673	1502
RELEASE	27589	562	266	347	1435	2483	2610	3247	3321	3064	2677	1282	632	829	1659	1673	1502
STORAGE	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621	1621
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	25.2	18.9	19.2	19.4	24.1	40.4	43.9	52.8	54.0	51.5	43.5	43.1	45.5	52.3	27.0	27.2	26.1
POWER																	
AVE POWER MW		90	90	91	113	189	205	247	252	243	211	213	225	257	135	133	125
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	1590.1	32.2	15.1	19.7	81.3	140.5	147.7	183.6	187.7	175.2	157.1	76.7	37.7	49.3	100.3	99.0	87.0
--FORT RANDALL--																	
NAT INFLOW	1251	149	70	89	205	206	243	80	47	46	6	4	2	2	14	30	59
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	81							6	19	24	18	4	2	2	7		
REG INFLOW	28681	710	335	435	1636	2680	2841	3303	3334	3080	2663	1281	631	828	1665	1700	1558
RELEASE	28681	419	201	435	1636	2680	2841	3303	3334	3226	3306	1602	747	854	1562	1350	1184
STOR CHANGE	0	291	134					0	0	-146	-643	-321	-116	-26	103	350	374
STORAGE	3124	3415	3549	3549	3549	3549	3549	3549	3549	3403	2760	2439	2323	2297	2400	2750	3124
ELEV FTMSL	1350.0	1353.6	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.3	1344.8	1350.0
DISCH KCFS	19.5	14.1	14.5	24.4	27.5	43.6	47.7	53.7	54.2	54.2	53.8	53.8	53.8	53.8	25.4	22.0	20.6
POWER																	
AVE POWER MW		116	122	206	232	343	356	355	355	352	335	306	290	284	185	166	163
PEAK POW MW		351	356	356	356	356	356	355	355	349	317	295	286	283	294	319	339
ENERGY GWH	2405.1	41.9	20.6	44.5	166.9	254.9	256.4	264.2	264.2	253.6	249.4	110.3	48.8	54.6	137.9	123.5	113.6
--GAVINS POINT--																	
NAT INFLOW	2311	166	77	99	279	260	285	192	138	133	144	71	33	38	120	120	156
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-4	10	-1	-19	-6	-31	-8	-11	-1	0	1	0	0	0	53	6	3
EVAPORATION	24							2	5	6	6	1	1	1	3		
REG INFLOW	30850	595	278	516	1904	2890	3094	3443	3456	3357	3443	1666	778	889	1722	1476	1343
RELEASE	30850	595	278	516	1904	2890	3094	3443	3443	3332	3443	1666	778	889	1722	1476	1381
STOR CHANGE									13	25							-38
STORAGE	342	342	342	342	342	342	342	342	355	380	380	380	380	380	380	380	342
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	23.0	20.0	20.0	28.9	32.0	47.0	52.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	28.0	24.0	24.0
POWER																	
AVE POWER MW		69	69	98	106	112	111	111	112	114	115	115	115	115	79	79	78
PEAK POW MW		114	114	114	114	112	111	111	112	115	115	115	115	115	78	78	76
ENERGY GWH	884.7	24.8	11.6	21.2	76.0	83.7	80.2	82.3	83.0	82.1	85.5	41.4	19.3	22.1	58.5	58.7	54.5
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	3646	353	165	212	729	560	560	336	173	131	103	50	23	27	67	48	110
DEPLETION	266	7	3	4	22	36	31	39	36	24	11	6	3	3	13	14	14
REGULATED FLOW AT SIOUX CITY																	
KAF	34230	941	439	723	2611	3414	3623	3740	3580	3439	3535	1710	798	912	1776	1510	1477
KCFS		31.6	31.6	40.5	43.9	55.5	60.9	60.8	58.2	57.8	57.5	57.5	57.5	57.5	28.9	24.6	25.7
--TOTAL--																	
NAT INFLOW	37900	2657	1239	1593	5081	4963	8949	4674	1585	1385	1422	634	296	338	892	899	1292
DEPLETION	2329	12	6	7	75	495	1527	1094	208	-208	-85	-135	-63	-72	-202	-206	-124
CHAN STOR	-63	49	-1	-19	-37	-141	-15	-11	-38	-2	2	0	0	-1	174	-26	3
EVAPORATION	1262							88	274	338	287	67	31	35	143		
STORAGE	56817	58570	59364	60208	62565	63478	67262	67002	64486	62301	59987	58979	58509	57972	57322	56891	56833
SYSTEM POWER																	
AVE POWER MW		854	867	987	1210	1840	1925	2073	2082	2035	1891	1848	1864	1958	1189	1266	1237
PEAK POW MW		2333	2338	2355	2378	2383	2396	2386	2370	2362	2344	2308	2295	2287	2254	2274	2282
ENERGY GWH	14298.2	307.4	145.7	213.2	870.9	1369.0	1386.2	1542.3	1549.1	1465.4	1406.8	665.4	313.1	375.9	884.9	941.9	861.0
DAILY GWH		20.5	20.8	23.7	29.0	44.2	46.2	49.8	50.0	48.8	45.4	44.4	44.7	47.0	28.5	30.4	29.7

	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

[redacted] NWO

From: [redacted] NWD02
Sent: Tuesday, January 04, 2011 8:41 AM
To: Farhat, Jody S NWD02
Cc: [redacted] NWD02
Subject: 2011 Monthly Runoff Forecast (UNCLASSIFIED)
Attachments: Runoff_Forecast_Jan2011.pdf; Runoff_Forecast_2010.pdf

Classification: UNCLASSIFIED
Caveats: FOUO

Jody,

The preliminary monthly calendar year runoff forecast for 2011 (Runoff_Forecast_Jan2011.pdf) is 25.1 MAF above Gavins Point and 27.9 MAF above Sioux City. The 2010 calendar year finished with 28.4 MAF above Gavins Point and 38.8 MAF above Sioux City (Runoff_Forecast_2010.pdf).

January and February of 2011 runoff will continue to be above normal as a result of high soil moisture conditions in the basin and high winter streamflows. Furthermore the climatic outlook is forecasting an increased probability of precipitation in the Northern Plains and Rockies with below average temperatures in the Northern Plains through the end of March. Above average runoff continues in March and April due to snowmelt from a plains snow pack that is similar to January 1, 2010 levels. Runoff will return to normal volumes in non-mountain basins in May.

Mountain snowpack on January 1, 2011, was 119% of normal above Fort Peck and 111% of normal from Fort Peck to Garrison; therefore, if the above average snowpack trend continues, May - July runoff into Fort Peck and Garrison is expected to be about 110% and 105% of normal in May, respectively, decreasing slightly in June and July. Runoff into Fort Peck and Garrison will return to normal in August.

Due to the very wet conditions in the Sioux City to Gavins Point reach over the past two years, runoff will continue to be above normal throughout the 2011 calendar year.

Please review the attached forecast and let us know when you'd like to discuss it.

Thanks.

[redacted]

[redacted]
USACE, Northwestern Division
Missouri Basin Water Management Division
[redacted]@usace.army.mil

Classification: UNCLASSIFIED
Caveats: FOUO

Missouri River Basin
Calendar Year 2011
Forecasted

3-Jan-11

Reach Above	Fort Peck	Garrison	Oahe	Fort Randall	Gavins Point	Sioux City	Summation above Gavins Point	Summation above Sioux City	Accumulated Summation above Sioux City
				Values in 1000 Acre Feet					
	(Forecast)								
JAN 2010	336	304	40	30	125	100	835	935	935
NORMAL	312	261	12	25	100	40	710	750	750
DEPARTURE	24	43	28	5	25	60	125	185	185
% OF NORM	108%	116%	333%	120%	125%	250%	118%	125%	125%
FEB 2010	376	380	100	55	140	180	1,051	1,231	2,166
NORMAL	360	356	90	49	130	92	985	1,077	1,827
DEPARTURE	16	24	10	6	10	88	66	154	339
% OF NORM	104%	107%	111%	112%	108%	196%	107%	114%	119%
MAR 2010	675	1,380	990	228	253	540	3,526	4,066	6,232
NORMAL	596	1,003	567	209	206	299	2,581	2,880	4,707
DEPARTURE	79	377	423	19	47	241	945	1,186	1,525
% OF NORM	113%	138%	175%	109%	123%	181%	137%	141%	132%
APR 2010	825	1,380	660	152	207	540	3,224	3,764	9,996
NORMAL	649	1,080	481	144	180	360	2,534	2,894	7,601
DEPARTURE	176	300	179	8	27	180	690	870	2,395
% OF NORM	127%	128%	137%	106%	115%	150%	127%	130%	132%
MAY 2010	1,190	1,310	312	147	186	400	3,145	3,545	13,541
NORMAL	1,081	1,245	312	147	186	292	2,971	3,263	10,864
DEPARTURE	109	65	0	0	0	108	174	282	2,677
% OF NORM	110%	105%	100%	100%	100%	137%	106%	109%	125%
JUN 2010	1,740	2,750	423	152	178	350	5,243	5,593	19,134
NORMAL	1,612	2,667	423	152	178	286	5,032	5,318	16,182
DEPARTURE	128	83	0	0	0	64	211	275	2,952
% OF NORM	108%	103%	100%	100%	100%	122%	104%	105%	118%
JUL 2010	895	1,830	179	57	137	240	3,098	3,338	22,472
NORMAL	819	1,776	179	57	137	218	2,968	3,186	19,368
DEPARTURE	76	54	0	0	0	22	130	152	3,104
% OF NORM	109%	103%	100%	100%	100%	110%	104%	105%	116%
AUG 2010	353	604	65	39	115	144	1,176	1,320	23,792
NORMAL	353	604	65	39	115	131	1,176	1,307	20,675
DEPARTURE	0	0	0	0	0	13	0	13	3,117
% OF NORM	100%	100%	100%	100%	100%	110%	100%	101%	115%
SEP 2010	333	452	111	38	111	109	1,045	1,154	24,946
NORMAL	333	452	111	38	111	99	1,045	1,144	21,819
DEPARTURE	0	0	0	0	0	10	0	10	3,127
% OF NORM	100%	100%	100%	100%	100%	110%	100%	101%	114%
OCT 2010	385	523	66	5	120	86	1,099	1,185	26,131
NORMAL	385	523	66	5	120	78	1,099	1,177	22,996
DEPARTURE	0	0	0	0	0	8	0	8	3,135
% OF NORM	100%	100%	100%	100%	100%	110%	100%	101%	114%
NOV 2010	384	398	67	6	118	83	973	1,056	27,187
NORMAL	384	398	67	6	118	76	973	1,049	24,045
DEPARTURE	0	0	0	0	0	7	0	7	3,142
% OF NORM	100%	100%	100%	100%	100%	109%	100%	101%	113%
DEC 2010	329	247	0	12	100	56	688	744	27,931
NORMAL	329	247	0	12	100	52	688	740	24,785
DEPARTURE	0	0	0	0	0	4	0	4	3,146
% OF NORM	100%	100%	100%	100%	100%	108%	100%	101%	113%
				Calendar Year Totals					
NORMAL	7,821	11,558	3,013	921	1,790	2,828	25,103	27,931	
DEPARTURE	7,213	10,612	2,373	883	1,681	2,023	22,762	24,785	
% OF NORM	608	946	640	38	109	805	2,341	3,146	
	108%	109%	127%	104%	106%	140%	110%	113%	

Missouri River Basin
Calendar Year 2010 with Holdouts thru July 2010
Forecasted

31-Dec-10

Reach Above	Fort Peck	Garrison	Oahe	Fort Randall	Gavins Point	Sioux City	Summation above Gavins Point	Summation above Sioux City	Accumulated Summation above Sioux City
				Values in 1000 Acre Feet					
JAN 2010	(Actual) 330	319	38	176	176	262	1,039	1,301	1,301
NORMAL	312	261	12	25	100	40	710	750	750
DEPARTURE	18	58	26	151	76	222	329	551	551
% OF NORM	106%	122%	317%	704%	176%	655%	146%	173%	173%
FEB 2010	319	285	69	119	149	188	941	1,129	2,430
NORMAL	360	356	90	49	130	92	985	1,077	1,827
DEPARTURE	-41	-71	-21	70	19	96	-44	52	603
% OF NORM	89%	80%	77%	243%	115%	204%	96%	105%	133%
MAR 2010	583	754	1,378	955	496	1,675	4,166	5,841	8,271
NORMAL	596	1,003	567	209	206	299	2,581	2,880	4,707
DEPARTURE	-13	-249	811	746	290	1,376	1,585	2,961	3,564
% OF NORM	98%	75%	243%	457%	241%	560%	161%	203%	176%
APR 2010	396	695	1,014	272	198	1,211	2,575	3,786	12,057
NORMAL	649	1,080	481	144	180	360	2,534	2,894	7,601
DEPARTURE	-253	-385	533	128	18	851	41	892	4,456
% OF NORM	61%	64%	211%	189%	110%	336%	102%	131%	159%
MAY 2010	890	980	592	140	175	740	2,777	3,517	15,574
NORMAL	1,081	1,245	312	147	186	292	2,971	3,263	10,864
DEPARTURE	-191	-265	280	-7	-11	448	-194	254	4,710
% OF NORM	82%	79%	190%	95%	94%	253%	93%	108%	143%
JUN 2010	1,982	3,365	661	440	567	1,580	7,015	8,595	24,169
NORMAL	1,612	2,667	423	152	178	286	5,032	5,318	16,182
DEPARTURE	370	698	238	288	389	1,294	1,983	3,277	7,987
% OF NORM	123%	126%	156%	289%	319%	552%	139%	162%	149%
JUL 2010	1,244	2,453	281	124	249	1,460	4,351	5,811	29,980
NORMAL	819	1,776	179	57	137	218	2,968	3,186	19,368
DEPARTURE	425	677	102	67	112	1,242	1,383	2,625	10,612
% OF NORM	152%	138%	157%	218%	182%	670%	147%	182%	155%
AUG 2010	372	508	186	64	117	1,212	1,247	2,459	32,439
NORMAL	353	604	65	39	115	131	1,176	1,307	20,675
DEPARTURE	19	-96	121	25	2	1,081	71	1,152	11,764
% OF NORM	105%	84%	286%	164%	102%	925%	106%	188%	157%
SEP 2010	444	506	218	34	212	757	1,414	2,171	34,610
NORMAL	333	452	111	38	111	99	1,045	1,144	21,819
DEPARTURE	111	54	107	-4	101	658	369	1,027	12,791
% OF NORM	133%	112%	196%	89%	191%	765%	135%	190%	159%
OCT 2010	404	439	6	39	95	822	983	1,805	36,415
NORMAL	385	523	66	5	120	78	1,099	1,177	22,996
DEPARTURE	19	-84	-60	34	-25	744	-116	628	13,419
% OF NORM	105%	84%	9%	780%	79%	1054%	89%	153%	158%
NOV 2010	327	304	60	12	131	276	834	1,110	37,525
NORMAL	384	398	67	6	118	76	973	1,049	24,045
DEPARTURE	-57	-94	-7	6	13	200	-139	61	13,480
% OF NORM	85%	76%	90%	200%	111%	363%	86%	106%	156%
DEC 2010	377	422	84	22	176	170	1,081	1,251	38,776
NORMAL	329	247	0	12	100	52	688	740	24,785
DEPARTURE	48	175	84	10	76	118	393	511	13,991
% OF NORM	115%	171%	21025%	185%	176%	328%	157%	169%	156%
				Calendar Year Totals					
	7,668	11,030	4,587	2,397	2,741	10,353	28,423	38,776	
NORMAL	7,213	10,612	2,373	883	1,681	2,023	22,762	24,785	
DEPARTURE	455	418	2,214	1,514	1,060	8,330	5,660	13,991	
% OF NORM	106%	104%	193%	271%	163%	512%	125%	156%	

[redacted] NWO

From: [redacted]A NWD02
Sent: Saturday, January 01, 2011 10:41 PM
To: Farhat, Jody S NWD02; [redacted] NWD02
Subject: Oa - Ga

Jody,
They've reduced hourly releases at Garrison. The operator will be talking to the powerplant near Stanton sometime after midnight to see how it's going. The stage at stnd has not leveled off yet.

The stages were also high below Oahe so I had Western reduce releases there. I put the one unit minimum on overnight.

Mike

Message sent via my BlackBerry Wireless Device

[redacted] NWO

From: Farhat, Jody S NWD02
Sent: Wednesday, January 05, 2011 12:17 PM
To: [redacted] NWO; [redacted] NWD02
Cc: [redacted] NWO; [redacted] NWD02; [redacted]
Subject: RE: Jan 2011 Monthly Reservoir Studies - Conf call Wed Jan 5th at 10:30 am Central Time - Draft studies attached (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

[redacted] - We show the pulse like this on the studies for a reason and we will continue to do so.

Although the pulse would be limited to 10,000 cfs IF we are meeting all navigation targets, it ABSOLUTELY could be higher than 10,000 cfs if we are NOT serving navigation at Sioux City, Omaha and/or Nebraska City. That's why we feel it is very important to put the calculated pulse magnitude on the header line of the studies - it really could be that high. And as you know, there is virtually no navigation above Kansas City, so it is not unreasonable to think we may be missing targets.

The study itself uses the book values for navigation flow support which assume we are meeting all targets and therefore in the monthly average flows for May we assume a maximum 10,000 cfs release due to the downstream flow limits. When we present this information to the public in the AOP and press releases we explain this rationale, and we also let them know that until 1 May these numbers can and will change. What we don't want is anyone out there saying it CANNOT be any higher than 10,000 cfs.

Jody

-----Original Message-----
From: [redacted] NWO
Sent: Wednesday, January 05, 2011 10:17 AM
To: [redacted] NWD02
Cc: Farhat, Jody S NWD02; [redacted] NWO; [redacted] NWO
Subject: RE: Jan 2011 Monthly Reservoir Studies - Conf call Wed Jan 5th at 10:30 am Central Time - Draft studies attached (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

[redacted],

Why are you showing the calculated number for each model run when the spring pulse values in the model runs are 10, 10, and 0 kcfs (basic, lower basic, and upper basic)? This is the public's first opportunity to see the Corps' first forecast that is based on current conditions instead of August 1 conditions as a starting point. Since the May spring pulse can be no higher than 10 kcfs if we are on the navigation target flow at the controlling downstream flow limit location, we should be telling the public that the May spring pulse is a 10 (more correctly a maximum of 10 kcfs). The computed number has no relevance in 2011, and that is the number you have elected to present instead of the number in the model run.

I will not be on the call as I am involved with another issue.

[redacted]
Spring Pulse Socioeconomic Monitoring
Missouri River Recovery Program
Phone: [redacted]
Fax: [redacted]

-----Original Message-----
From: [redacted] NWD02
Sent: Wednesday, January 05, 2011 9:38 AM
To: Farhat, Jody S NWD02; [redacted] NWD02; [redacted] NWD02; [redacted] NWO;
[redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted],
[redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted]
[redacted] NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO;
[redacted] HQ02@NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted]
NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWD02; [redacted] NWO; [redacted]
[redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted]
NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO;
NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO;
[redacted] NWO; Schenk, Kathryn M NWO; [redacted] NWO; [redacted] NWO;
[redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO;
[redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO; [redacted] NWO;
[redacted] NWD02; [redacted] NWO; [redacted] NWO; [redacted] NWO;
NWO; [redacted] NWD02; Farmer, Monique L NWO; [redacted]
[redacted] NWO; [redacted] NWO
Subject: Jan 2011 Monthly Reservoir Studies - Conf call Wed Jan 5th at 10:30 am Central Time - Draft studies attached (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Phone No. [redacted]
Access Code [redacted]
Note: If prompted for a security code, type in 1234 followed by the # sign.

[redacted]
Hydraulic Engineer
Missouri River Basin Water Management
U.S. Army Corps of Engineers
[redacted]

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

[redacted]NWO

From: Farhat, Jody S NWD02
Sent: Monday, January 10, 2011 9:18 AM
To: William Lay
Subject: RE: Snow Back (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Bill - you may not have responsibility, but you do understand how the system works! It's much easier to move water downstream than upstream, so we're not too disappointed that Oahe will start the year low with a little extra in Fort Peck and Garrison. We're also getting a good start of the plains snowpack so will be watching it closely through the remainder of the winter.

Hope you had a very nice holiday season. I'll see you at the MRRIC meeting in February.

Jody

-----Original Message-----
From: William Lay [mailto:[redacted]]
Sent: Friday, January 07, 2011 5:39 PM
To: Farhat, Jody S NWD02
Subject: Snow Back

Dear Jody,

Since you have a 114 snow pack about Fort Peck, maby you can hold a good deal of that in Fort Peck. You could hold it until the other reservoirs were down to where you could conveniently release it.

That is just a theory from someone who who doesn't have any responsibility.

You can probably tell me a dozen reasons why my theory is flawed.

Bill Lay

Classification: UNCLASSIFIED
Caveats: FOUO

[redacted] NWO

From: William Lay [wlay@socket.net]
Sent: Friday, January 07, 2011 5:40 PM
To: Farhat, Jody S NWD02
Subject: Snow Back

Dear Jody,

Since you have a 114 snow pack about Fort Peck, maby you can hold a good deal of that in Fort Peck. You could hold it until the other reservoirs were down to where you could conveniently release it.

That is just a theory from someone who who doesn't have any responsibility.

You can probably tell me a dozen reasons why my theory is flawed.

Bill Lay

[redacted] NWO

From: William Lay [wlay@socket.net]
Sent: Friday, January 07, 2011 4:41 PM
To: Farhat, Jody S NWD02
Subject: Fort Peck and Garrison a little above Base

Dear Jody,

It is a good idea to start Fort Peck and Garrison a little high and have storage in the lower reservoirs

I am sure you won't be surprised with my views on that.

Maybe we won't have as much water in 2011, but even if we have less, you will still have the water and you will have it were you can better handle it.

Thanks

Bill Lay

[redacted] NWO

From: [redacted] NWO
Sent: Tuesday, January 11, 2011 3:35 PM
To: [redacted] NWD02; [redacted] NWD02; Farhat, Jody S NWD02; [redacted] NWD02; [redacted] NWO [redacted] NWO
Cc:
Subject: Gavins to Ponca Ice Conditions

To all: Our guys went down river on the SD side and did not see any ice jams. River was flowing approximately 80% ice. Access was very limited due to the heavy snow we've had. The last spot they could see the river was with binoculars downstream of Ponca and they said the river was flowing but couldn't tell much of anything else. Tomorrow they'll go down the SD side to Vermillion bridge, cross to Nebraska and try to get access. Bryan.

[redacted] NWO

From: Farhat, Jody S NWD02
Sent: Friday, January 14, 2011 5:01 PM
To: Schenk, Kathryn M NWO
Subject: Missouri River Water Management Update (UNCLASSIFIED)
Attachments: Missouri River Mainstem Reservoir System Status 14Jan2011.docx

Classification: UNCLASSIFIED
Caveats: NONE

Katie,

The attached document has bullet points on current conditions and Water Management's planned spring public meetings for use in the meeting next week with North Dakota.

Jody

Classification: UNCLASSIFIED
Caveats: NONE

Missouri River Mainstem Reservoir System Status
14 Jan 2011

Total storage in the Missouri River Mainstem Reservoir System is currently 56.9 million acre-feet (MAF), just 0.1 MAF above the base of the annual flood control zone. The reservoir system is on track to complete the evacuation of the over 9 MAF of flood water stored in 2010. The full flood control capacity of the reservoir system will be available at the start of the 2011 runoff season on 1 March.

Both Garrison and Fort Peck will start the 2011 runoff season slightly above the base of the annual flood control pool, but Oahe will be slightly below the base its annual flood control pool. This slight unbalancing (extra flood control storage in a downstream reservoir rather than an upstream reservoir) actually provides additional flexibility for flood control regulation.

Releases from Garrison have been limited this winter due to ice conditions below the project, particularly in the Bismarck area. These lower-than-planned releases have been necessary to prevent ice-induced flooding and have resulted in the slight unbalancing of the reservoir system.

Mountain Snowpack is slightly above normal at 106 percent of average in the reach above Fort Peck and 113 percent of average in the reach between Fort Peck and Garrison. Normally 52 percent of the peak accumulation has occurred by mid-January.

Plains snow conditions are considered "moderate" above Fort Peck, Garrison and Oahe Dams and are "light to moderate" above Big Bend, Fort Randall and Gavins Point Dams for this time of the year. Snow Water Equivalent (SWE) ranges from 2 -3 inches in the upper basins and 0-2 inches in the lower basins. Plains snow conditions in the Gavins to Sioux City reach, which primarily includes the James and Big Sioux River basins are "moderate" with SWE ranging from 2-4 inches.

Soil moisture conditions in the upper basin above the mainstem reservoir system are very moist.

Based on these early season conditions, the forecasted runoff above Sioux City, Iowa for calendar year 2011 is 27.8 MAF, 112% of normal. This forecast is updated on a monthly basis. The next forecast will be completed on 2 February 2011.

Runoff into the lower Missouri River below the reservoir system is considered normal for this time of year.

Long range forecasts indicate the northern edge of the basin will be somewhat cooler than normal over the next several months with above normal precipitation in Montana, Wyoming and North Dakota consistent with ongoing La Nina oceanic conditions. Warmer and drier than normal conditions are forecast for the lower basin.

Six spring public meetings are planned for the week of April 11-15. Arrangements are being made for meetings in Fort Peck, MT; Bismarck, ND; Pierre, SD; Nebraska City, NE; Kansas City, MO; and Jefferson City, MO.

POC: Jody Farhat, Chief, Missouri River Basin Water Management Division
Jody.s.farhat@usace.army.mil Office phone: 402-996-3840

[redacted] NWO

From: Farhat, Jody S NWD02
Sent: Tuesday, January 18, 2011 12:08 PM
To: Jeff Dooley
Subject: RE: Runoff (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Jeff - Runoff in the Missouri River basin above Sioux City in 2010 was 38.7 million acre-feet, 156 percent of normal and the third highest runoff on record. Snowpack in the winter of 2009-2010 was quite a bit lower than this year. In mid-Jan 2010 the mountain snowpack was only 76 percent of normal. However, it's important to remember that last year's high runoff wasn't from snowmelt either on the plains or in the mountains; it was due to much above normal rainfall that started late spring and lasted most of the summer.

Jody

-----Original Message-----
From: Jeff Dooley [mailto:jeff.dooley@dakotadunes.com]
Sent: Monday, January 17, 2011 9:42 AM
To: Farhat, Jody S NWD02
Subject: Runoff

Hi Jody:

The article below was on the SF Argus Leader Website. It states that the Corps expects runoff to be 12 percent above normal in 2011. What was the actual runoff in 2010? The article also says snowpack was 16 percent above normal. What was it in 2010?

2010 was an "interesting" year on the Missouri, I was just trying to get a perspective of how 2011 is shaping up. Thanks.

Jeff Dooley

Manager

Dakota Dunes Community Improvement District

605-232-4211

Classification: UNCLASSIFIED
Caveats: NONE

[redacted] NWO

From: [redacted] NWD02
Sent: Tuesday, January 18, 2011 9:33 AM
To: Farhat, Jody S NWD02; [redacted] NWD02; [redacted] NWD02; [redacted] NWD02; [redacted] NWO; [redacted] NWD02; [redacted] NWD02; [redacted] NWD02
Subject: FW: Change in Flood Stage at Brownville, NE (UNCLASSIFIED)
Attachments: PNS_BRON1.pdf

Classification: UNCLASSIFIED
Caveats: NONE

FYI. We'll need to make adjustments to plots and bulletins.

[redacted]

[redacted]
Reservoir Regulation Team Lead
Missouri River Basin Water Management,
Northwestern Division, USACE
[redacted]
[redacted] (fax)

-----Original Message-----
From: David Pearson [mailto:david.pearson@noaa.gov]
Sent: Tuesday, January 18, 2011 9:14 AM
To: [redacted] NWD02; Joe Gorman; Jason Lambrecht; Kevin Low; nemahaema@windstream.net; Kris D Lund
Cc: Scott.Watson@noaa.gov; Bryon Miller; Rebecca Kern; James Meyer; Brian E. Smith
Subject: Change in Flood Stage at Brownville, NE

Hello,

Today the flood stage for the Missouri River at Brownville, NE has been changed to 33 feet. Attached is the official change notice that was sent out about a month ago. Please let me know if you have any questions about this change.

regards,

--
David Pearson
Senior Service Hydrologist
Omaha/Valley NWS
(402) 359-5166 x493
(402) 359-4381 (after hours)

Classification: UNCLASSIFIED
Caveats: NONE

Service Change Notice
National Weather Service Omaha/Valley, Nebraska

...Change in flood stage on the Missouri River near Brownville...

To: Family of Services /FOS/ Subscribers...NOAA Weather Wire Service /NWWS/ Subscribers...Emergency Managers Weather Information Network /EMWIN/ Subscribers...NOAAport Subscribers...Other National Weather Service /NWS/ Customers and Partners...NWS Employees

From: James Meyer
Meteorologist In Charge
WFO Omaha/Valley - Valley, Nebraska

Subject: Change in flood stage on the Missouri River near Brownville

...Near Brownville affecting Atchison and Nemaha counties...
The flood stage on the Missouri River at the Brownville river gauge is being changed from 32 to 33 feet. This change is the result of several site visits to the Brownville area during times of high water. During these visits it was noted that the flood stage should be raised to 33 feet since no flooding was occurring at a stage of 32 feet. Please note this change in flood stage to 33 feet only applies to the river gauge at Brownville. At 33 feet lowlands on both banks begin to flood and only minor flooding should be expected.

Real-time data and forecasts are available on the internet at:

http://water.weather.gov/ahps2/index.php?wfo=oax

or

http://water.weather.gov/ahps2/hydrograph.php?wfo=oax&gage=bron1&view=1,1,1,1,1,1,1,1

The National Weather Service welcomes feedback. If you have any questions or comments on the information included in this document, please contact:

David Pearson

Senior Service Hydrologist
National Weather Service Forecast Office
6707 North 288th Street
Valley, NE 68064-9443

Phone: (402) 359-5166 ext. 493
Email: david.pearson@noaa.gov

[redacted] NWO

From: Farhat, Jody S NWD02
Sent: Monday, January 24, 2011 9:49 AM
To: [redacted] NWO
Subject: RE: Missouri River Releases (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Thanks for the info, Todd. As I'm sure you know, once we get a good ice cover established we can generally make gradual increases in the releases without increasing the stage due to the smoothing of the underside of the ice and the channel bottom.

We're also watching the snow pack with trepidation. The trick will be to throttle back Garrison's releases as the trib inflow picks up, but if the river is still frozen, this will be a challenge. We'll want to avoid disturbing the ice while making some room in the channel for local inflows. All suggestions are welcome!

Jody

-----Original Message-----
From: [redacted] NWO
Sent: Monday, January 24, 2011 9:25 AM
To: Farhat, Jody S NWD02
Subject: FW: Missouri River Releases (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Jody,
This is simply FYI. We have lots of folks watching the river up here and folks are very concerned with the increasing snowpack in the area.
[redacted]

-----Original Message-----
From: Michael Gunsch [mailto:mgunsch@houstoneng.com]
Sent: Saturday, January 22, 2011 11:42 PM
To: [redacted] NWO
Subject: RE: Missouri River Releases

[redacted]

No significant changes since the December rise, but have also not seen the changes expected with an increase from 18k to 25K. Have to wonder if the small rises and falls in the gage record correspond to flow changes and how the river has not notably changed in elevation as the flows increased - seems a bit unusual though not impossible. I am surprised that 25k has not created higher stages. Glad you are watching things, will continue to monitor here and if something happens we will let you know.

Thanks for the info on the press release as the BCWRD had input to that as well. The public remains a bit jumpy around here so whenever there is a change someone calls. Understand the need to get rid of water, sounds like there will be a lot again this spring.

At some point prior to inflows from the downstream tributaries I suggest a meeting with the BC and Morton County Emergency Managers.

If nothing else to keep the lines of communication open prior to local flood issues.

Thanks for the quick response.

Michael H. Gunsch, PE, Principal / Project Manager

3712 Lockport Street
Bismarck, ND 58503
Phone (701) 323-0200
Cell (701) 527-2134
Fax (701) 323-0300
e-mail mgunsch@houstoneng.com<mailto:mgunsch@houstoneng.com>

From: [redacted] NWO [[redacted]@usace.army.mil]
Sent: Saturday, January 22, 2011 2:31 PM
To: Michael Gunsch
Subject: Re: Missouri River Releases

Mike,
I'm assuming the "stage rise" you're referring to was the one back in December. That rise appeared to be ice related and we reduced releases. Since we have had a fairly consistent ice cover we have been slowly increasing releases to a 25k daily average. I have not noted any stage increases of significant concern, unless something changed dramatically since yesterday?

I did provide Burleigh county some comments from USACE for a press release at that time. I have not seen any changes which would warrant a press release since the rapid stage increase prior to the Holidays unless I missed something?

We continue to monitor the stages in Bismarck and have changed releases very conservatively. However, we need to move some water out of Fort Peck and Garrison prior to this Spring's runoff. Please keep me posted if you see any significant changes.
Todd

Message sent via my BlackBerry Wireless Device

From: Michael Gunsch <mgunsch@houstoneng.com>
To: [redacted] NWO
Cc: Fleck Terry (tfleck@attitudedr.com) <tfleck@attitudedr.com>; kenroyse@bartwest.com <ken.royse@bartwest.com>; Gailen Narum <gonarum@yahoo.com>; 'Senger, Mary H.' <msenger@nd.gov>
Sent: Sat Jan 22 08:50:23 2011
Subject: Missouri River Releases

[redacted]

I see the flow call report for Garrison this week is for 25,000 cfs.
Is the rise in stage in Bismarck shown on the graph below ice related or is it part of the increase in flows to 25,000 cfs?
There was concern this was ice related, which it appears was only part of the change?
Let me know as there is a need to keep the public informed on this issue.
Also the release of such flows has risks depending on river ice conditions.

Let me know - Thanks,

I wonder if when changes of this nature are made that a public press release or notice is not advisable?
That way we can avoid local concerns of what it might be vs. not what it is really is.

Burleigh County Emergency Management has to issue a press release to calm a number of questions and calls.
It migh be better it come from or through the COE?

Enjoy the Day..

Michael

[Description: Graph of Gage height, feet]

Michael H. Gunsch, PE, Senior Project Manager/Principal
[Description: Description: cid:021080921@26012009-10E2]
3712 Lockport Street
Bismarck, ND 58503
Phone (701) 323-0200
Cell (701) 527-2134
Fax (701) 323-0300
e-mail mgunsch@houstoneng.com<mailto:mgunsch@houstonengineeringinc.com>

Classification: UNCLASSIFIED
Caveats: FOUO

[redacted] NWO

From: Farhat, Jody S NWD02
Sent: Tuesday, January 25, 2011 9:58 AM
To: William Lay
Subject: RE: Spring flows (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Bill - sorry it took me so long to reply.

At the present time we feel we're in excellent shape to capture this year's runoff and prevent flood damages downstream, but what really matters with regard to downstream flooding is the runoff that occurs below Gavins Point. As you know we are nearly done evacuating last summer's flood waters - only 100,000 acre-feet to go, and we are slightly unbalanced, but in a way that bodes well for downstream interests. Oahe will come in a foot or two low relative to the other dams, so that gives us more flexibility to capture runoff lower in the system and reduce releases from Gavins Point in response to any flooding from downstream snowmelt or rainfall. The mountain snowpack is a bit above normal for this time of the year, and we're developing a pretty good plains snowpack, so we will put some water in the upper flood pools, but at this time it doesn't appear to be more than we can handle and our most-likely forecast just shows full service navigation flows, not flood evacuation above full service. Of course all that can change once the runoff begins and will also depend on how much we need to cut back Gavins due to downstream flooding, but for now it appears to be manageable.

Let me know if you have other questions.

Take care,
Jody

-----Original Message-----
From: William Lay [mailto:[redacted]]
Sent: Wednesday, January 19, 2011 9:42 AM
To: Farhat, Jody S NWD02
Subject: Spring flows

Dear Jody,

I have read the St. Joseph News Press article, but the good reporter failed to cover some thoughts that occurred to me.

St. Joseph News Press
Saint Joseph, MO
01/17/2011

"Our current forecast shows system storage reaching the desired level of 56.8 million acre feet by March 1 in accordance with the Master Manual," said Jody Farhat, chief of the Water Management Division. "The reservoir system is in position to provide good levels of service to each of the congressionally authorized purposes, as well as to be prepared in the event that we experience a higher-than-normal runoff season."

Right now there is a looming problem that could impact river bottom farmers and Missouri River communities south of Omaha, Neb. The plains snow pack is above normal over most of the upper Missouri River basin. The mountain snow pack is 116 percent above normal. Traditionally, about 42 percent of the peak accumulation occurs by Jan. 1.

"If we get large amounts of runoff upstream above Gavins Point we can handle the runoff in an orderly fashion without stressing the levee systems in the vicinity of St. Joseph," Ms. Farhat said.

The current forecast for the 2011 runoff year is 27.8 million acre feet, 112 percent of normal. Rains this spring below Gavins Point along the Platte River in Nebraska as well as in southeast Nebraska, southwest Iowa, Northeast Kansas and Northwest Missouri, will be a factor for any flooding along the Missouri River from the Iowa state line south to Atchison, Kan.

As you might expect, these are my thoughts.

What sort of reductions in the proposed Gavins Point discharges can be made this spring?

Have we enough lower reservoir storage to hold the upper reservoir snow melt?

We probably can hold whatever snow melt we have above Fort Peck.

Your answer probably is ""it depends"

Bill Lay

Classification: UNCLASSIFIED

[redacted] NWO

From: [redacted] NWO
Sent: Monday, January 24, 2011 9:25 AM
To: Farhat, Jody S NWD02
Subject: FW: Missouri River Releases (UNCLASSIFIED)
Attachments: image005.jpg; image006.jpg

Classification: UNCLASSIFIED
Caveats: FOUO

Jody,
This is simply FYI. We have lots of folks watching the river up here and folks are very concerned with the increasing snowpack in the area.
[redacted]

-----Original Message-----
From: Michael Gunsch [mailto:mgunsch@houstoneng.com]
Sent: Saturday, January 22, 2011 11:42 PM
To: [redacted] NWO
Subject: RE: Missouri River Releases

Todd:

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If nothing else to keep the lines of communication open prior to local flood issues.

Thanks for the quick response.

Michael H. Gunsch, PE, Principal / Project Manager

3712 Lockport Street
Bismarck, ND 58503
Phone (701) 323-0200
Cell (701) 527-2134

Fax (701) 323-0300
e-mail mgunsch@houstoneng.com<mailto:mgunsch@houstoneng.com>
P Please consider the environment before printing this e-mail This electronic data is transmitted for your convenience. The recipient agrees to indemnify and hold Houston Engineering, Inc. harmless from any liability arising from the use of the data. The recipient further agrees this data will not be transferred or shared with any other party. This electronic data is subject to change and updates are the responsibility of the recipient. Houston Engineering, Inc. is not responsible for updating the files or for compatibility with recipient's hardware and/or software. Please check this file for virus contamination prior to use.

From: [redacted] NWO [[redacted]@usace.army.mil]
Sent: Saturday, January 22, 2011 2:31 PM
To: Michael Gunsch
Subject: Re: Missouri River Releases

Mike,
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Todd

Message sent via my BlackBerry Wireless Device

From: Michael Gunsch <mgunsch@houstoneng.com>
To: [redacted] NWO
Cc: Fleck Terry (tfleck@attitudedr.com) <tfleck@attitudedr.com>; kenroyse@bartwest.com <ken.royse@bartwest.com>; Gailen Narum <gonarum@yahoo.com>; 'Senger, Mary H.' <msenger@nd.gov>
Sent: Sat Jan 22 08:50:23 2011
Subject: Missouri River Releases

[redacted]

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Enjoy the Day..

Michael

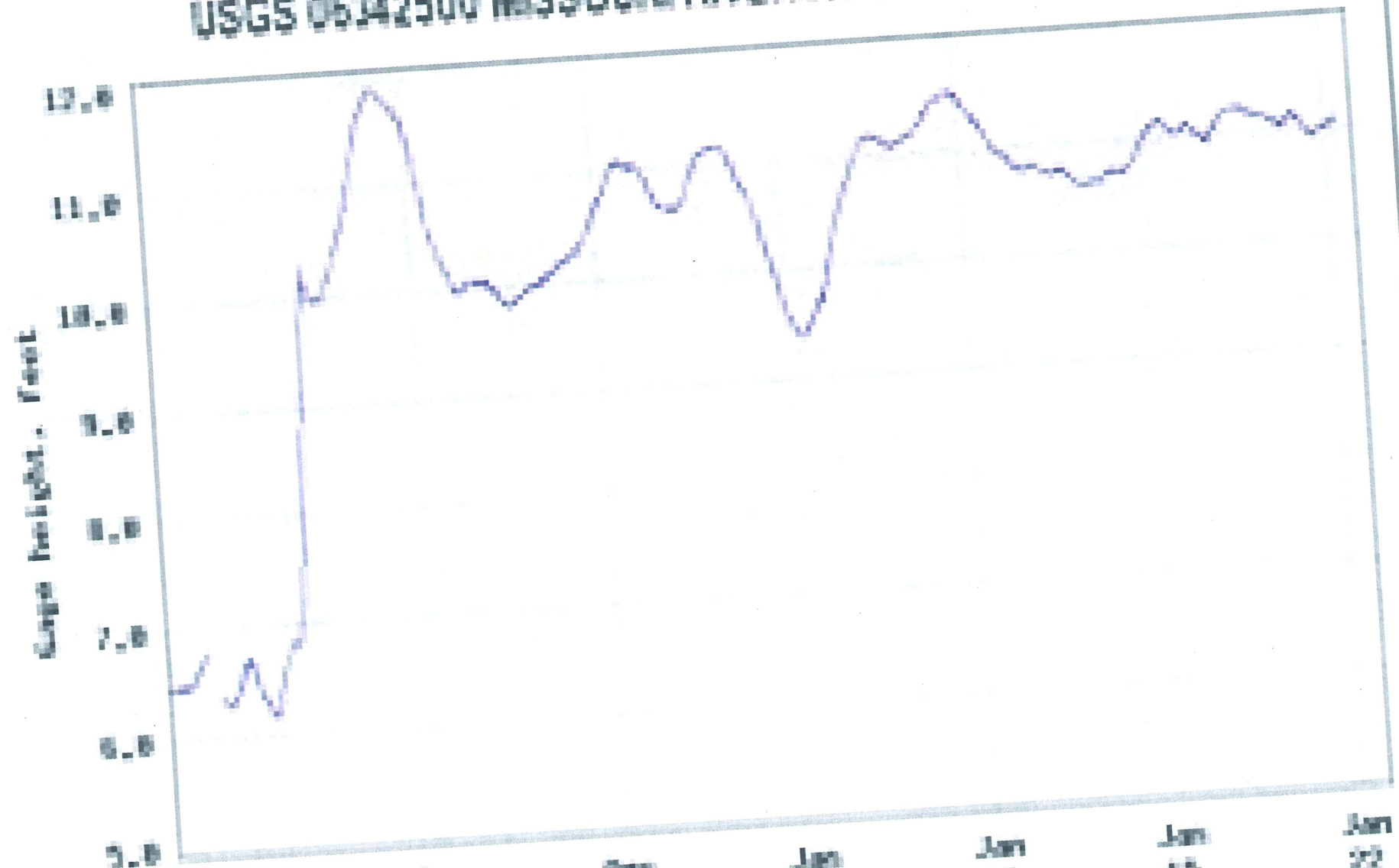
[Description: Graph of Gage height, feet]

Michael H. Gunsch, PE, Senior Project Manager/Principal
[Description: Description: cid:021080921@26012009-10E2]
3712 Lockport Street
Bismarck, ND 58503
Phone (701) 323-0200
Cell (701) 527-2134
Fax (701) 323-0300
e-mail mgunsch@houstoneng.com<mailto:mgunsch@houstonengineeringinc.com>

Classification: UNCLASSIFIED
Caveats: FOUO

USGS

USGS 06342500 MISSOURI RIVER AT BISMARCK, ND



[redacted] NWO

From: [redacted] NWO
Sent: Thursday, January 20, 2011 9:58 AM
To: Farhat, Jody S NWD02; [redacted] NWD02; [redacted] NWD02; [redacted] NWD02
Subject: FW: Snow Core Information from past three days (UNCLASSIFIED)
Attachments: Snow Core Sampling 2011.xlsx

Classification: UNCLASSIFIED
Caveats: NONE

FYI

-----Original Message-----
From: Tanja Fransen [mailto:tanja.fransen@noaa.gov]
Sent: Thursday, January 20, 2011 8:43 AM
To: Carrie Olheiser; Julie Meyer; Gina Loss; Marv Cross; [redacted] NWO; [redacted]
[redacted] NWO
Cc: ggw ops
Subject: Snow Core Information from past three days

Hi,

We had two staff members do snow core surveying the past two days, and they were able to get a fairly widespread area north of Fort Peck Lake and the Missouri River. We had some CoCoRaHS observers whom we asked to report their SWE as well. All that data is in the attached spreadsheet.

Snow cover is 100% of the area. They took some photos as well, I'll get with Rob today and they'll get labeled with locations. We'll probably put it in a .ppt.

Thank you Rob and Brian for doing these samples the last two days!

Tanja

--
Tanja Fransen
Warning Coordination Meteorologist
NOAA/National Weather Service Glasgow
101 Airport Rd.
Glasgow, MT 59230

406-228-2850
http://www.weather.gov/glasgow

Date of Ob	Time of Ob	Physical Location ie. 16SE Glasgow	County
1/18/2011	10:00	1 Mile E Scobey	Daniels
1/18/2011	9:00	Glasgow .9 ESE	Valley
1/18/2011	700	14.5 miles NNW of Glasgow	Valley
1/18/2011	745	3 miles South of Hinsdale	Valley
1/18/2011	830	.5 SE of Nelson Reservoir	Phillips
1/18/2011	945	2 Miles W of Dodson	Phillips
1/18/2011	1130	10 Miles N Malta	N. Phillip
1/18/2011	1300	6 Miles SW of Malta	Phillips
1/17/2011	1700	Port of Morgan	Phillips
1/18/2011	1430	7 Miles NW of Glasgow	Valley
1/18/2011	1530	9 Miles SE of Glasgow	Valley
1/19/2011	700	16.9 WSW Glendive	Dawson
1/19/2011	700	15.6 NNE Frazer	Valley
1/19/2011	700	Westby	Sheridan
1/19/2011	815	7 miles W of Glentana	N. Valley
1/19/2011	900	1 mile S of Richland	N. Valley
1/19/2011	945	2.5 Miles N of Scobey	Daniels
1/19/2011	1030	5 Miles S of Scobey	Daniels
1/19/2011	1100	14 Miles W of Plentywood	Sheridan
1/19/2011	1130	5 Miles N of Plentywood	Sheridan
1/19/2011	1330	2 Miles S of Medicine Lake	Sheridan
1/19/2011	1445	4.5 E of Culbertson	E. Roosevelt
1/19/2011	1540	7.5 N of Brockton	E. Roosevelt
1/20/2011	700	2.2W Glendive	Dawson
1/20/2011	700	4.3 NW Glasgow	Valley
1/20/2011	700	15.6 NNE Frazer	Valley
1/20/2011	645	5.1 E Flaxville	Daniels

Latitude (out to 4 decimal places)	Longitude (out to 4 decimal places)	Snow Depth	Snow Water Equivalent
48.79706	105.39563	13	2.2
48.194705	106.612508	19	3.49
48.37025	106.792806	15	3.5
48.3972	107.0532	14	3.2
48.497222	107.5222	24	4.5
48.400636	108.29978	17	2.6
48.4703	1077868	12	2.8
48.2917	107.9429	24	6.3
48.9997	107.8322	19	3.77
48.2683	106.746	20	4.6
48.10936	106.5552	17	3.3
46.992616	105.024788	14	1.09
48.2653	105.934	25	6.56
48.8707	104.5	17	3
48.8517	106.3943	11	3
48.8139	106.0651	15	3.4
48.8241	105.4244	13	2.9
48.7223	105.4204	11	2.4
48.7893	104.8364	12	2.6
48.8382	104.5798	8	2.2
48.4847	104.4912	15	3.6
48.1432	104.4309	16	4.1
48.2302	104.9006	15	3.8
47.105261	104.755056	15	2.64
48.246154	106.693211	21	3.75
48.2653	105.934	24	5.86
48.7931	105.06131	10.5	2.71

Misc.
CoCoRaHS - Ratio 0.169 Ground is not frozen deeply under snowpack
CoCoRaHS - NWS employee Ratio 0.183
Ratio 0.230
Ratio 0.228
Ratio 0.187
Ratio 0.153
Ratio 0.233
Ratio 0.267
Ratio 0.196
Ratio 0.230
Ratio 0.194
CoCoRaHS Ratio 0.078
CoCoRaHS - Ratio 0.262
Ratio 0.176
Ratio 0.272
Ratio 0.226
Ratio 0.223
Ratio 0.218
Ratio 0.216
Ratio 0.275
Ratio 0.240
Ratio 0.256
Ratio 0.253
CoCoRaHS Ratio 0.176 Ground not deeply frozen beneath snowpack
CoCoRaHS - NWS Employee Ratio 0.179
CoCoRaHS Ratio 0.244
CoCoRaHS Ratio 0.258

[redacted] NWO

From: [redacted] NWO
Sent: Tuesday, January 25, 2011 4:56 PM
To: DLL-CENWO-EOC CMT-ALL
Subject: Updated Comparison of Snow Water Equivalent(SWE) to recent years (UNCLASSIFIED)
Attachments: ND SD SWE Jan 25 2011.pptx

Classification: UNCLASSIFIED
Caveats: FOUO

CMT,

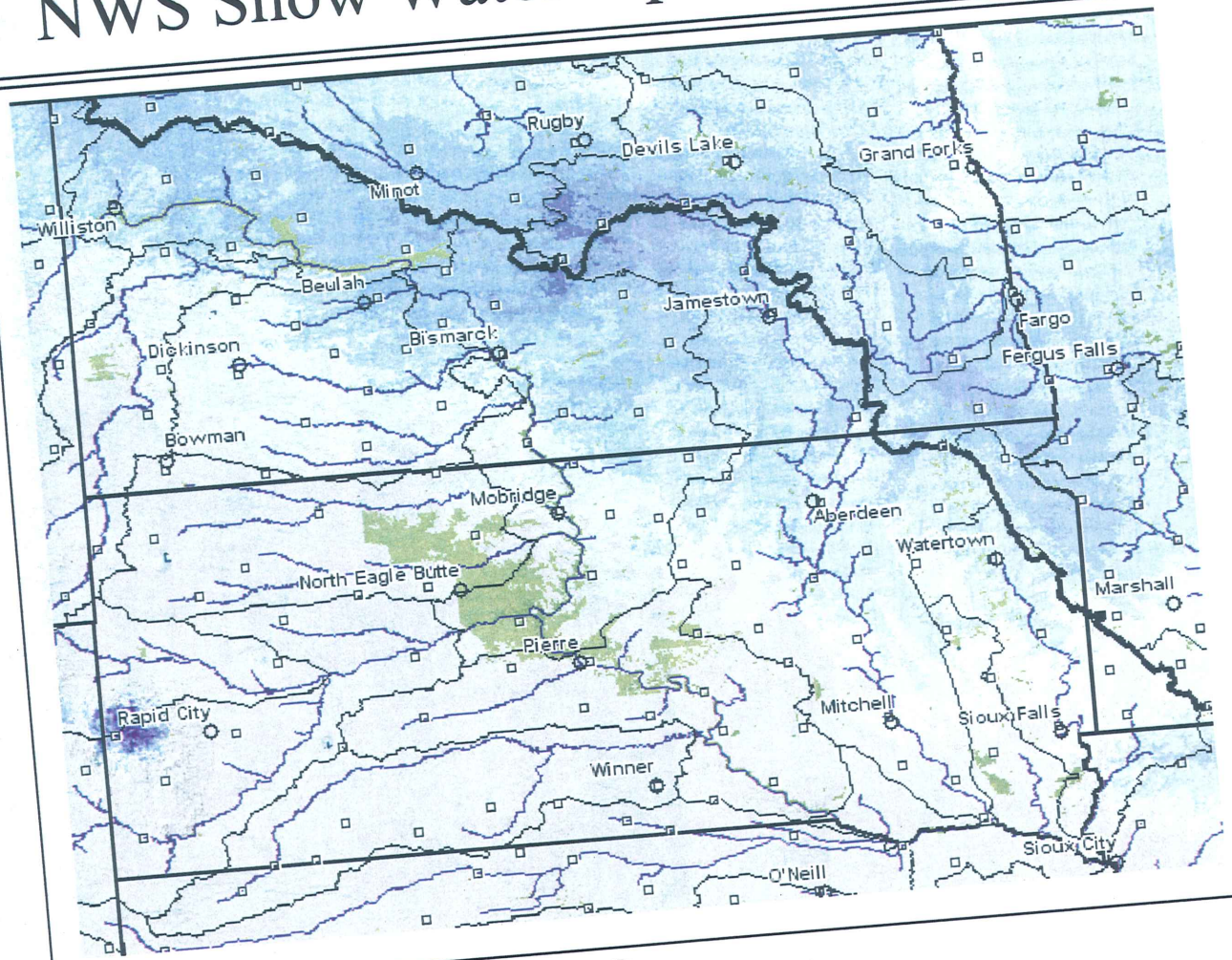
FYI. Updated Comparison of SWE's between 2009, 2010, and 2011. We are tracking more SWE in 2011 than previous year's numbers at this time.

Thanks,
[redacted]

[redacted]
Chief, Readiness Branch
U.S. Army Corps of Engineers - Omaha District
1616 Capitol Ave., Ste 9000
Omaha, NE 68102
[redacted] Office
[redacted] Blackberry
[redacted]@usace.army.mil

Classification: UNCLASSIFIED
Caveats: FOUO

NWS Snow Water Equivalent (SWE) – Jan. 25, 2009



Inches of water equivalent

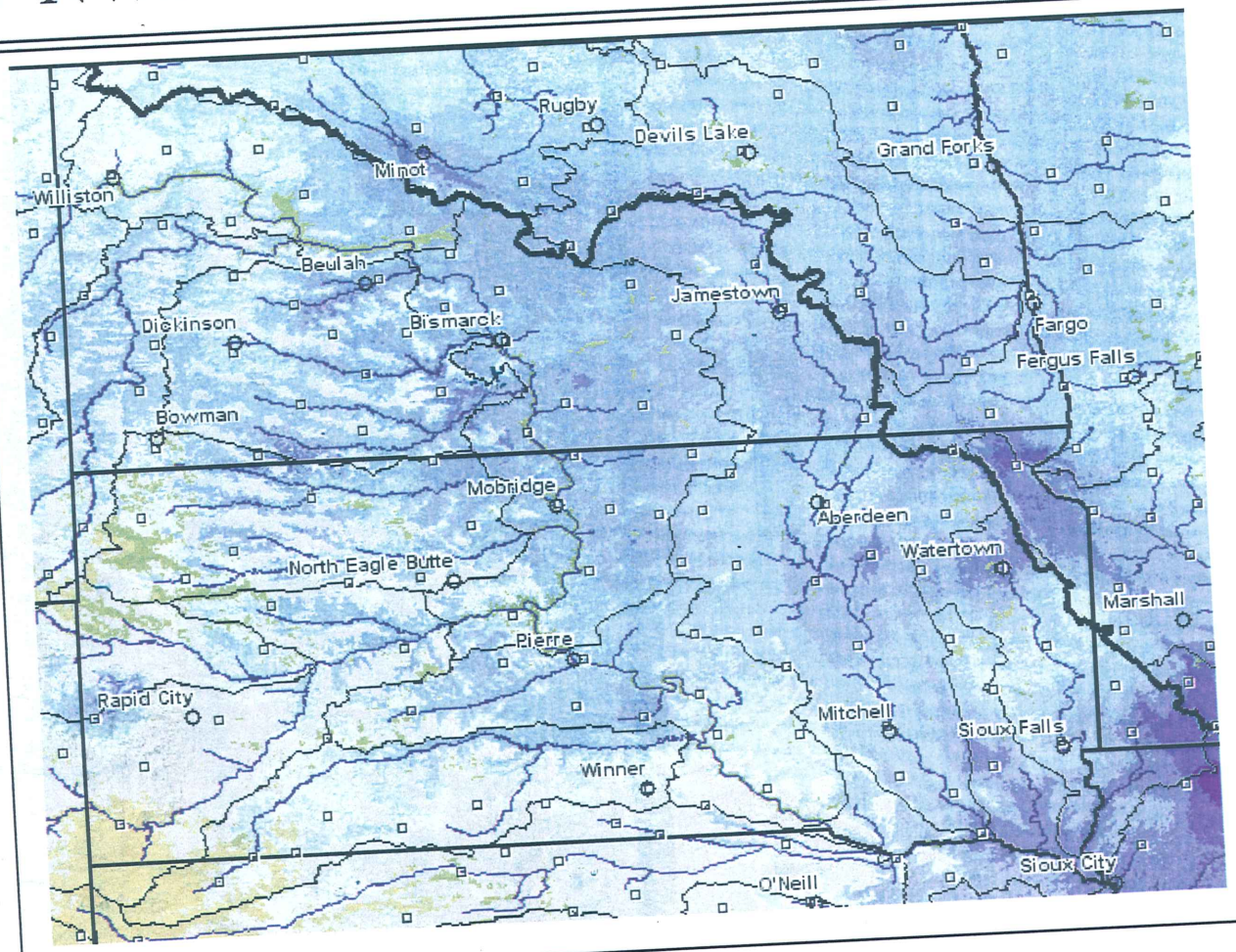
>			18
16	to		18
14	to		16
12	to		14
10	to		12
8	to		10
6	to		8
5	to		6
4	to		5
3	to		4
2	to		3
1	to		2
0	to		1

Not Estimated

Elevation in feet (Not estimated)

>			13124
8203	to		13124
3281	to		8203
3	to		3281
<			3

NWS Snow Water Equivalent (SWE) – Jan. 25, 2010



Inches of water equivalent

	>		18
16	to		18
14	to		16
12	to		14
10	to		12
8	to		10
6	to		8
5	to		6
4	to		5
3	to		4
2	to		3
1	to		2
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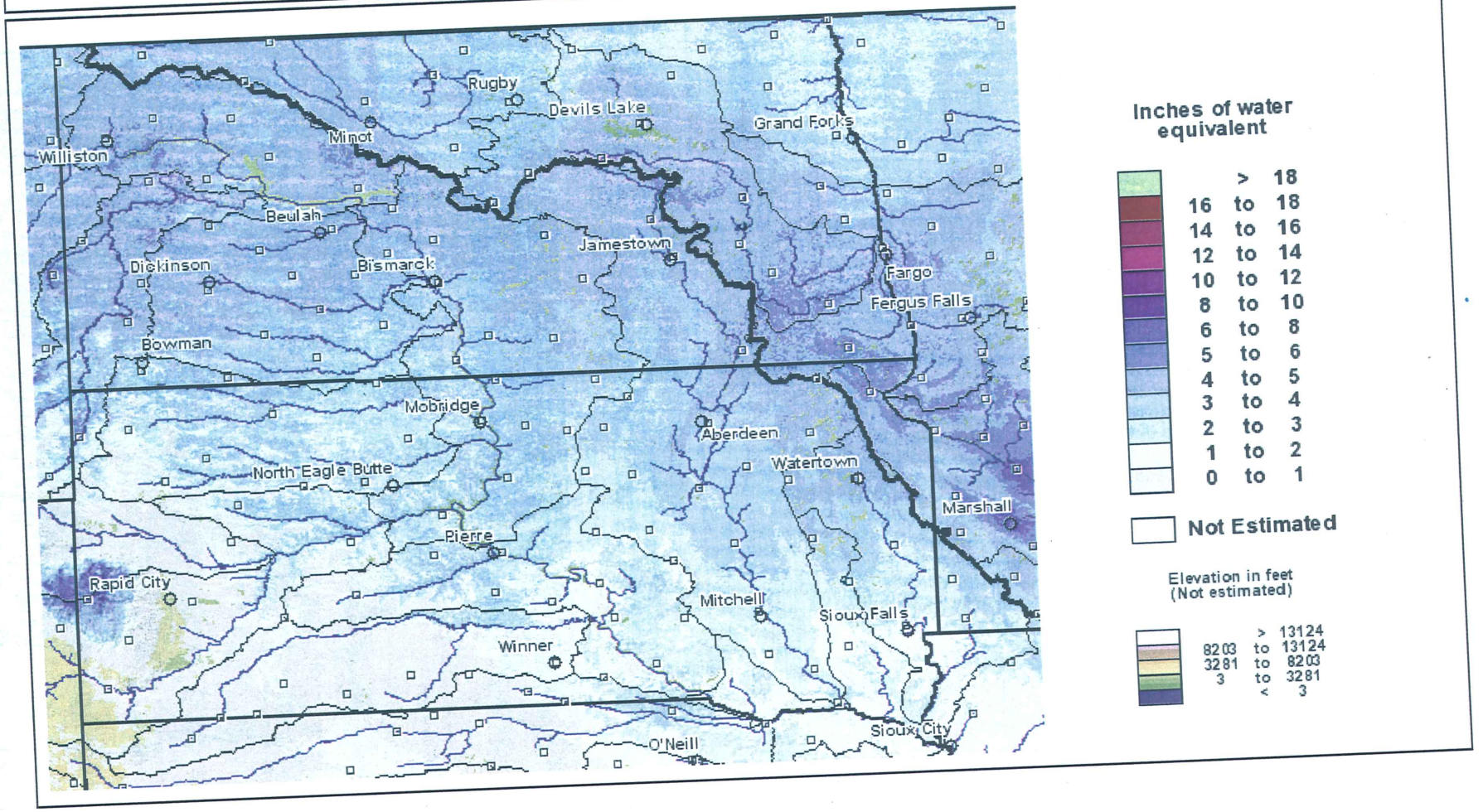
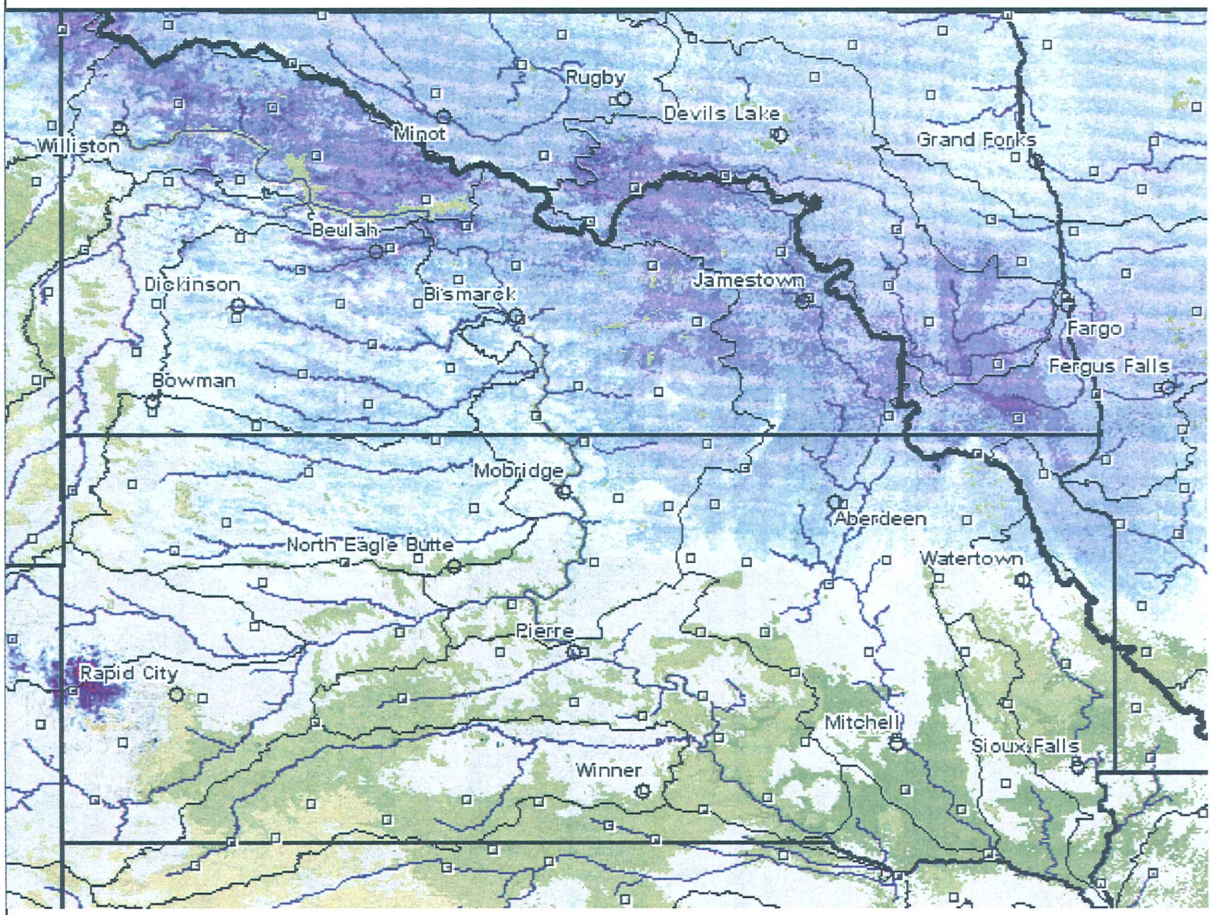
8203	to		13124
3281	to		8203
3	to		3281
	<		3

NWS Snow Water Equivalent (SWE) – Jan. 25, 2011



NWS Snow Water Equivalent (SWE) – March 14, 2009



Inches of water equivalent

>	18
16 to	18
14 to	16
12 to	14
10 to	12
8 to	10
6 to	8
5 to	6
4 to	5
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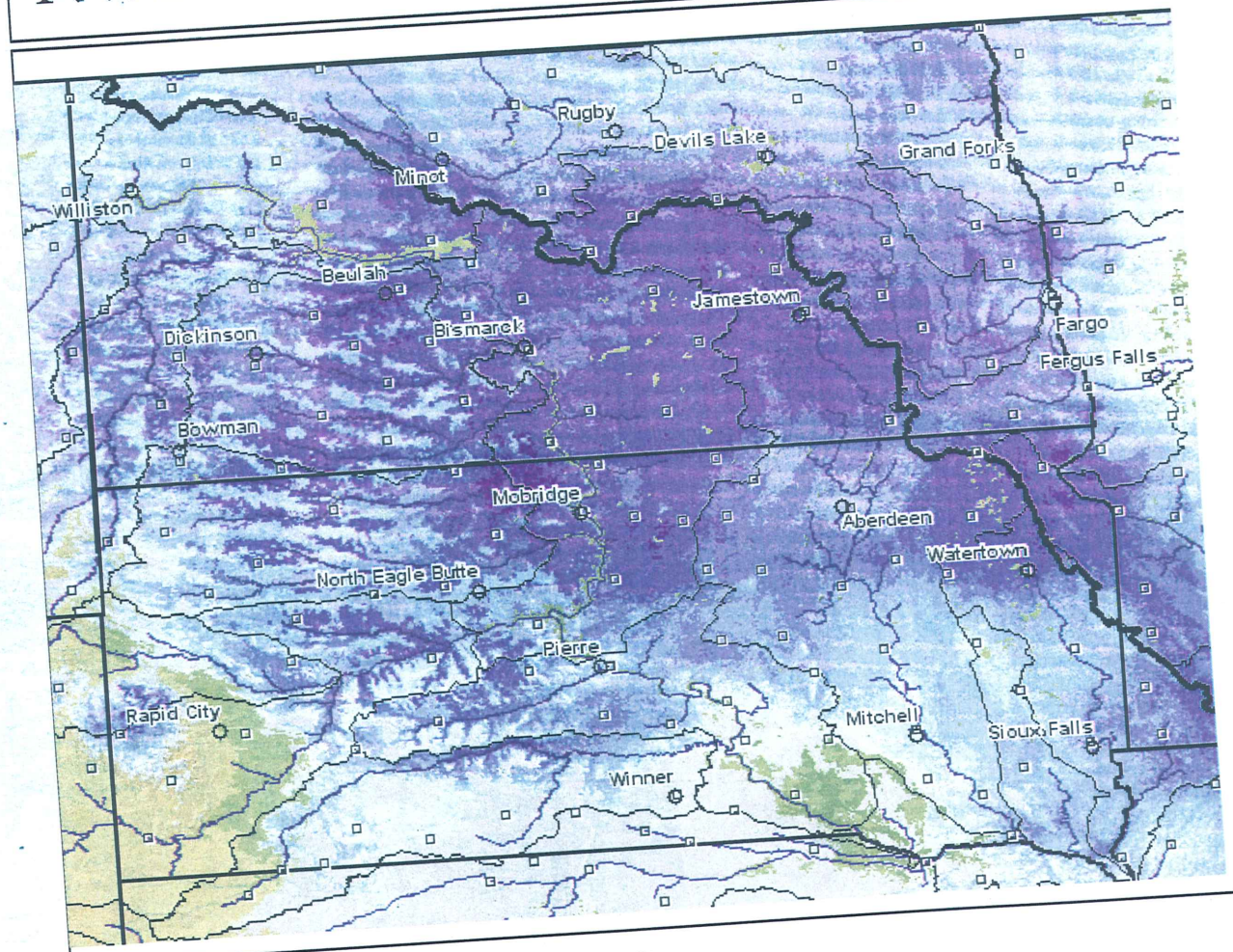
2 to	3
1 to	2
0 to	1

Not Estimated

Elevation in feet (Not estimated)

>	13124
8203 to	13124
3281 to	8203
3 to	3281
<	3

NWS Snow Water Equivalent (SWE) – March 14, 2010



Inches of water equivalent

>	18		
16	to	18	
14	to	16	
12	to	14	
10	to	12	
8	to	10	
6	to	8	
5	to	6	
4	to	5	
3	to	4	
2	to	3	
1	to	2	
0	to	1	

Not Estimated

Elevation in feet (Not estimated)

>	13124		
8203	to	13124	
3281	to	8203	
3	to	3281	
	<	3	

[redacted] NWO

From: William Lay [redacted]
Sent: Tuesday, January 25, 2011 11:45 AM
To: Farhat, Jody S NWD02
Subject: Re: Spring flows (UNCLASSIFIED)

Dear Jody,

I am sure you have been awful busy. It sounds like a good plan.

Managing those dams is an uncertain business.

Maybe this year will be easier, but we can't depend on it.

Bill Lay

On Jan 25, 2011, at 9:58 AM, Farhat, Jody S NWD02 wrote:

> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Hi Bill - sorry it took me so long to reply.
>
> At the present time we feel we're in excellent shape to capture this
> year's runoff and prevent flood damages downstream, but what really
> matters with regard to downstream flooding is the runoff that occurs below Gavins Point.
> As you know we are nearly done evacuating last summer's flood waters -
> only 100,000 acre-feet to go, and we are slightly unbalanced, but in a
> way that bodes well for downstream interests. Oahe will come in a
> foot or two low relative to the other dams, so that gives us more
> flexibility to capture runoff lower in the system and reduce releases
> from Gavins Point in response to any flooding from downstream snowmelt
> or rainfall. The mountain snowpack is a bit above normal for this
> time of the year, and we're developing a pretty good plains snowpack,
> so we will put some water in the upper flood pools, but at this time
> it doesn't appear to be more than we can handle and our most-likely
> forecast just shows full service navigation flows, not flood
> evacuation above full service. Of course all that can change once the
> runoff begins and will also depend on how much we need to cut back Gavins due to downstream
flooding, but for now it appears to be manageable.
>
> Let me know if you have other questions.
>
> Take care,
> Jody
>
> -----Original Message-----
> From: William Lay [mailto:[redacted]t]
> Sent: Wednesday, January 19, 2011 9:42 AM
> To: Farhat, Jody S NWD02
> Subject: Spring flows
>
> Dear Jody,
>

> I have read the St. Joseph News Press article, but the good reporter
> failed to cover some thoughts that occurred to me.
>
> St. Joseph News Press
> Saint Joseph, MO
> 01/17/2011
>
> "Our current forecast shows system storage reaching the desired level
> of 56.8 million acre feet by March 1 in accordance with the Master
> Manual," said Jody Farhat, chief of the Water Management Division.
> "The reservoir system is in position to provide good levels of service
> to each of the congressionally authorized purposes, as well as to be
> prepared in the event that we experience a higher-than-normal runoff season."
>
> Right now there is a looming problem that could impact river bottom
> farmers and Missouri River communities south of Omaha, Neb. The plains
> snow pack is above normal over most of the upper Missouri River basin.
> The mountain snow pack is 116 percent above normal. Traditionally,
> about 42 percent of the peak accumulation occurs by Jan. 1.
>
> "If we get large amounts of runoff upstream above Gavins Point we can
> handle the runoff in an orderly fashion without stressing the levee
> systems in the vicinity of St. Joseph," Ms. Farhat said.
>
> The current forecast for the 2011 runoff year is 27.8 million acre
> feet, 112 percent of normal. Rains this spring below Gavins Point
> along the Platte River in Nebraska as well as in southeast Nebraska,
> southwest Iowa, Northeast Kansas and Northwest Missouri, will be a
> factor for any flooding along the Missouri River from the Iowa state line south to
Atchison, Kan.
>
> As you might expect, these are my thoughts.
>
> What sort of reductions in the proposed Gavins Point
> discharges can be made this spring?
>
> Have we enough lower reservoir storage to hold the upper
> reservoir snow melt?

> We probably can hold whatever snow melt we have above Fort Peck.
>
> Your answer probably is ""it depends"
>
> Bill Lay
>
> Classification: UNCLASSIFIED
> Caveats: NONE

[redacted] NWO

From: Farhat, Jody S NWD02
Sent: Thursday, January 27, 2011 3:01 PM
To: [redacted] NWD02
Subject: FW: Updated Comparison of Snow Water Equivalent(SWE) to recent years (UNCLASSIFIED)
Attachments: ND SD SWE Jan 25 2011.pptx

Classification: UNCLASSIFIED
Caveats: FOUO

FYI

-----Original Message-----
From: [redacted] NWO
Sent: Tuesday, January 25, 2011 4:56 PM
To: DLL-CENWO-EOC CMT-ALL
Subject: Updated Comparison of Snow Water Equivalent(SWE) to recent years (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

CMT,

FYI. Updated Comparison of SWE's between 2009, 2010, and 2011. We are tracking more SWE in 2011 than previous year's numbers at this time.

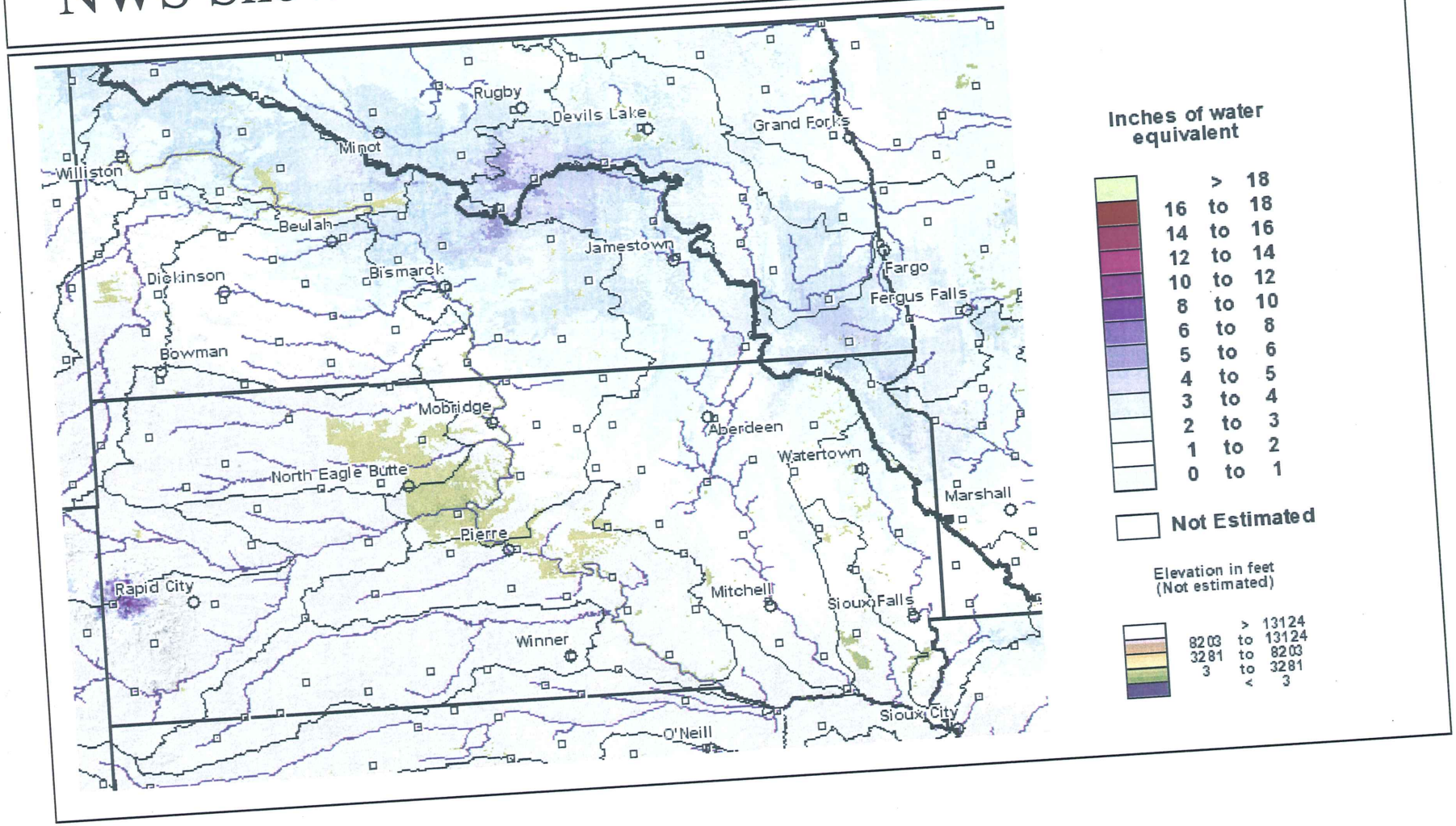
Thanks,
[redacted]

[redacted]
Chief, Readiness Branch
U.S. Army Corps of Engineers - Omaha District
1616 Capitol Ave., Ste 9000
Omaha, NE 68102
[redacted] Office
[redacted] Blackberry
[redacted]@usace.army.mil

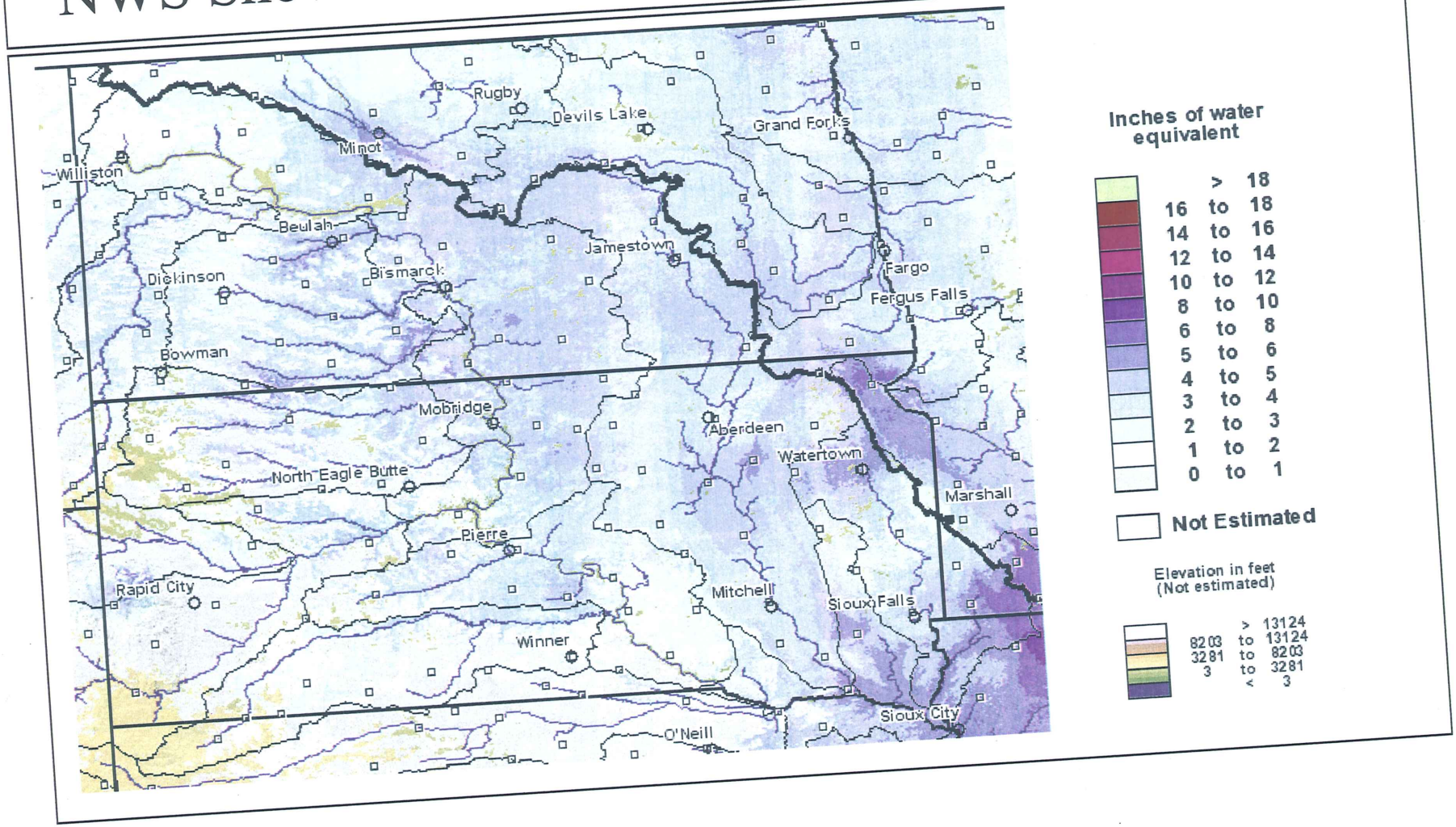
Classification: UNCLASSIFIED
Caveats: FOUO

Classification: UNCLASSIFIED
Caveats: FOUO

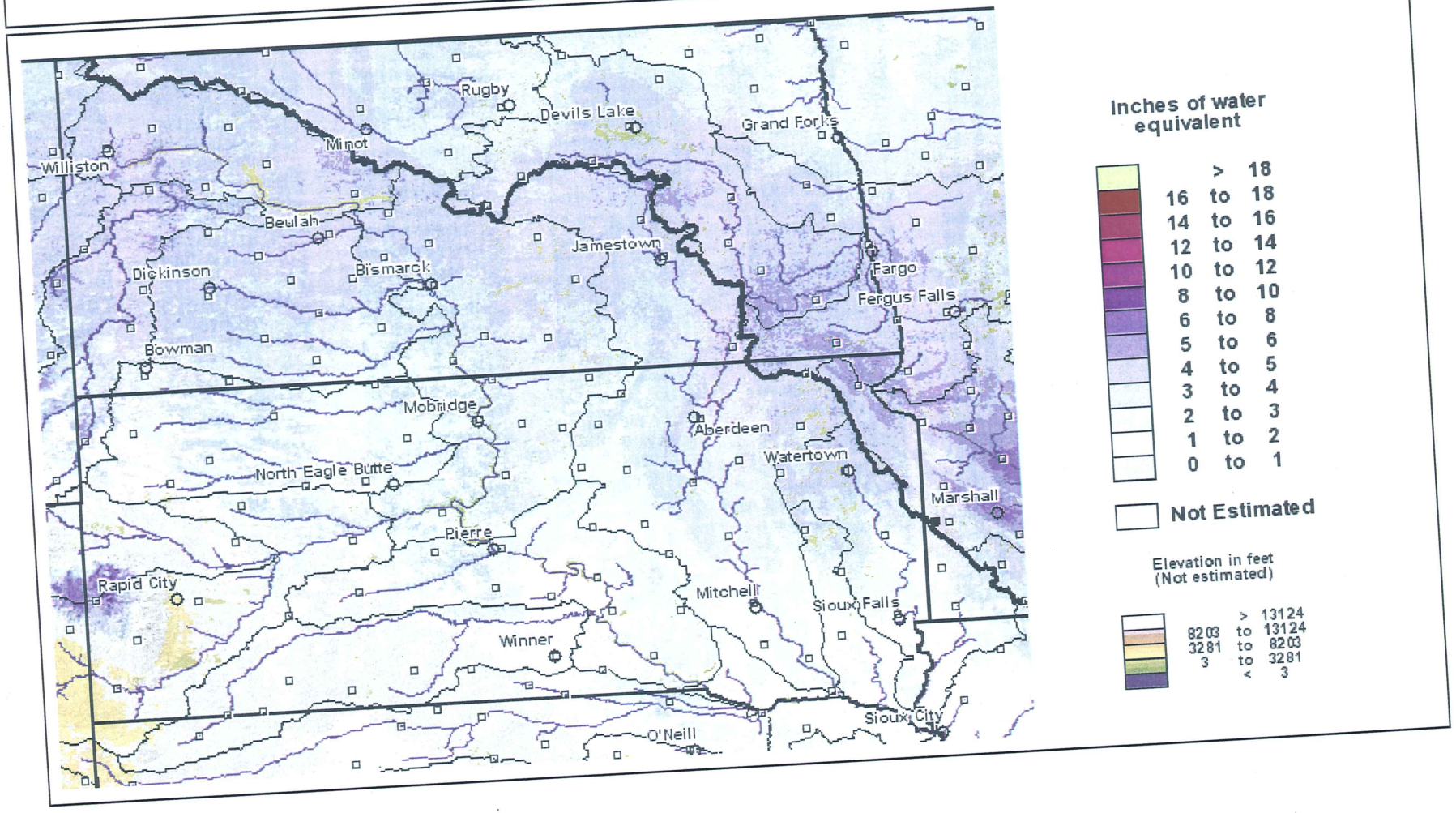
NWS Snow Water Equivalent (SWE) – Jan. 25, 2009



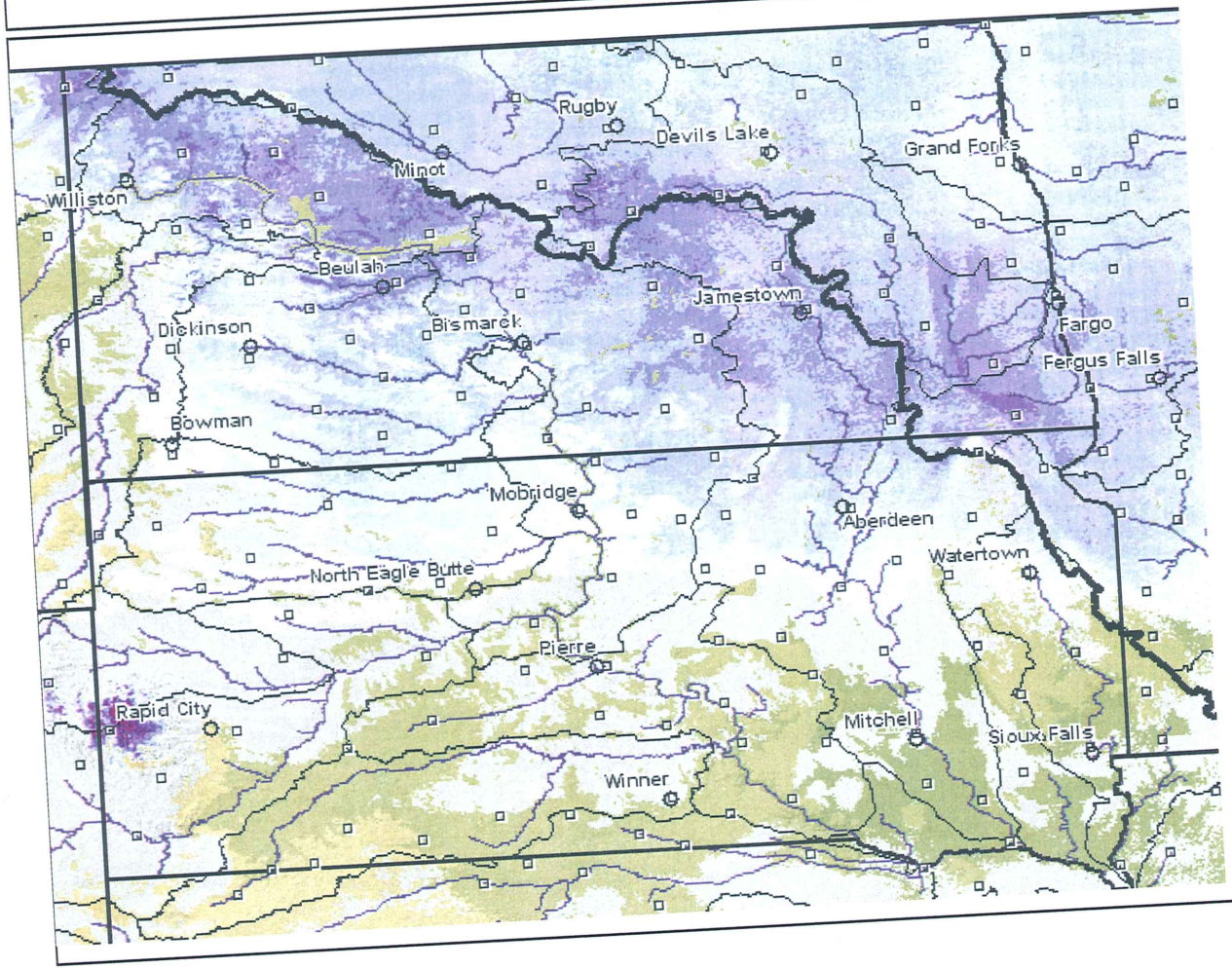
NWS Snow Water Equivalent (SWE) – Jan. 25, 2010



NWS Snow Water Equivalent (SWE) – Jan. 25, 2011



NWS Snow Water Equivalent (SWE) – March 14, 2009



Inches of water equivalent

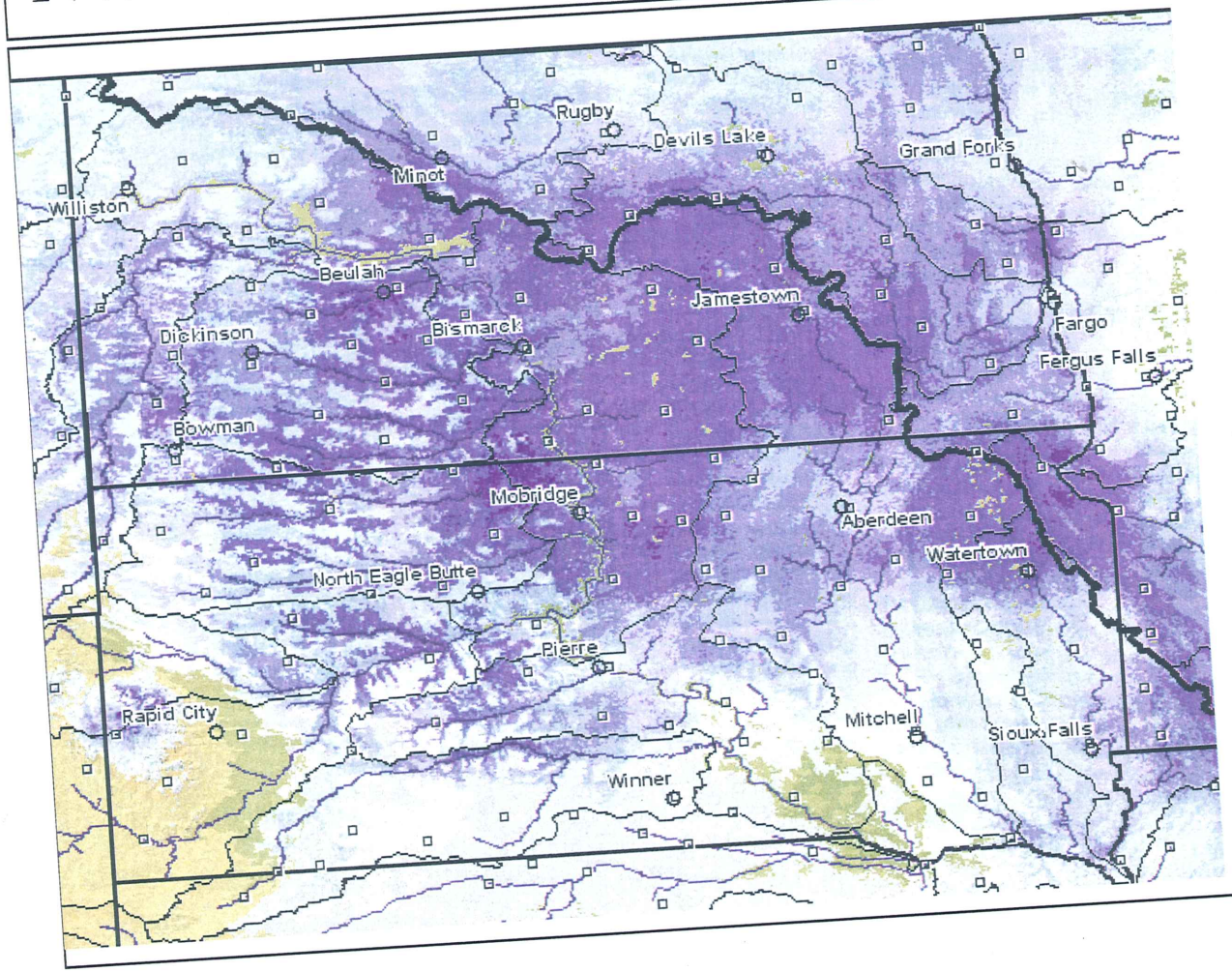
>	18
16 to	18
14 to	16
12 to	14
10 to	12
8 to	10
6 to	8
5 to	6
4 to	5
3 to	4
2 to	3
1 to	2
0 to	1

Not Estimated

Elevation in feet (Not estimated)

>	13124
8203 to	13124
3281 to	8203
3 to	3281
<	3

NWS Snow Water Equivalent (SWE) – March 14, 2010



Inches of water equivalent

	>		18
16	to		18
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12	to		14
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Not Estimated

Elevation in feet (Not estimated)

	>		13124
8203	to		13124
3281	to		8203
3	to		3281
	<		3

[redacted] NWO

From: Farhat, Jody S NWD02
Sent: Friday, January 28, 2011 9:34 AM
To: Barnes, Verlon
Subject: Missouri River Water Management update (UNCLASSIFIED)
Attachments: Missouri River Mainstem Reservoir System Status 25Jan2011.docx

Classification: UNCLASSIFIED
Caveats: NONE

Verlon - Here's my latest status report FYI.

Let me know if you have any questions.

Regards,
Jody

Jody Farhat, P.E.
Chief, Missouri River Basin Water Management

jody.s.farhat@usace.army.mil
Office: 402-996-3840
Cell: 402-350-1417
Home: [redacted]

Classification: UNCLASSIFIED
Caveats: NONE

Missouri River Mainstem Reservoir System Status
25 Jan 2011

Total storage in the Missouri River Mainstem Reservoir System is currently 56.9 million acre-feet (MAF), just 0.1 MAF above the base of the annual flood control zone. The reservoir system is on track to complete the evacuation of the over 9 MAF of flood water stored in 2010. The full flood control capacity of the reservoir system will be available at the start of the 2011 runoff season on 1 March.

Both Garrison and Fort Peck will start the 2011 runoff season slightly above the base of the annual flood control pool, but Oahe will be slightly below the base its annual flood control pool. This slight unbalancing (extra flood control storage in a downstream reservoir rather than an upstream reservoir) actually provides additional flexibility for flood control regulation.

Releases from Garrison have been limited this winter due to ice conditions below the project, particularly in the Bismarck area. These lower-than-planned releases have been necessary to prevent ice-induced flooding and have resulted in the slight unbalancing of the reservoir system.

Mountain Snowpack is slightly above normal at 116 percent of average in the reach above Fort Peck and 114 percent of average in the reach between Fort Peck and Garrison. Normally 61 percent of the peak accumulation has occurred by 1-February.

Plains snow conditions are considered "moderate" above Fort Peck, Garrison and Oahe Dams and are "light to moderate" above Big Bend, Fort Randall and Gavins Point Dams for this time of the year. Snow Water Equivalent (SWE) ranges from 2 -3 inches in the upper basins and 0-2 inches in the lower basins. Plains snow conditions in the Gavins to Sioux City reach, which primarily includes the James and Big Sioux River basins are "moderate" with SWE ranging from 2-4 inches.

Soil moisture conditions in the upper basin above the mainstem reservoir system are very moist.

Based on these early season conditions, the forecasted runoff above Sioux City, Iowa for calendar year 2011 is 27.8 MAF, 112% of normal. This forecast is updated on a monthly basis. The next forecast will be completed on 2 February 2011.

Runoff into the lower Missouri River below the reservoir system is considered normal for this time of year.

Long range forecasts indicate the northern edge of the basin will be somewhat cooler than normal over the next several months with above normal precipitation in Montana, Wyoming and North Dakota consistent with ongoing La Nina oceanic conditions. Warmer and drier than normal conditions are forecast for the lower basin.

March and May spring pulses from Gavins Point dam are planned this year. The "downstream flow limits" provide triggers to reduce the peak of the pulses or eliminate them completely if downstream river conditions warrant. Additional protection is provided through the use of observed and forecasted rainfall in the river forecast model.

Stages on the lower river resulting from the spring pulse are expected to be well within the channel and will not impact areas protected by levees that were damaged by last year's flood.

Six spring public meetings are planned for the week of April 11-15.

April 12 - Nebraska City
- Fort Peck

April 13 - Bismarck
- Pierre

April 14 - Jefferson City
- Kansas City

Details regarding the times and places will be included in a press release and posted on our website when they become available

POC: Jody Farhat, Chief, Missouri River Basin Water Management Division
Jody.s.farhat@usace.army.mil Office phone: 402-996-3840

[redacted] NWO

From: Hofmann, Anthony J COL NWK
Sent: Thursday, January 27, 2011 8:06 AM
To: [redacted] NWK; Farhat, Jody S NWD02
Cc: Anderson, G Witt NWD
Subject: Re: Levee Rehabilitation Update (UNCLASSIFIED)

Agree [redacted] thanks Jody.
MLDDA knows the deal but they just don't like to hear the facts. But facts are what they will get.

Colonel Tony Hofmann, PMP
Commander, Kansas City District
U.S. Army Corps of Engineers
BB: 816-807-0129

----- Original Message -----
From: [redacted] NWK
To: Farhat, Jody S NWD02
Cc: Anderson, G Witt NWD; McMahon, John R BG NWD; Hofmann, Anthony J COL NWK; [redacted] NWK; [redacted] NWK
Sent: Thu Jan 27 05:56:04 2011
Subject: Re: Levee Rehabilitation Update (UNCLASSIFIED)

Jody,

Thanks for your prompt response and you have provided similar response to MLDDA in the past.

[redacted]

----- Original Message -----
From: Farhat, Jody S NWD02
To: Tom & Karla Waters <waters4@ix.netcom.com>
Cc: Anderson, G Witt NWD; [redacted] NWK; McMahon, John R BG NWD; Hofmann, Anthony J COL NWK; [redacted] NWK
Sent: Wed Jan 26 15:24:32 2011
Subject: RE: Levee Rehabilitation Update (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Tom,

Thank you for your recent email to Des Goyal regarding implementation of the March spring pulse from Gavins Point Dam in light of the fact that that levee repairs are incomplete. As you know, the Master Manual spring pulse technical criteria includes safeguards to minimize risk to downstream interests. These safeguards are termed 'downstream flow limits' and are well below the channel capacity of the Missouri River. Also, these flow limits are identical to the most restrictive of the flood control constraints presented in the previous Master Manual (prior to the 2006 revision) and provide a very similar level of flood protection. Additional safeguards have been added compared to the criteria in the previous Master Manual Under the current Master Manual, we incorporate anticipated precipitation into our river forecast to provide greater assurance that flows will remain below the downstream flow limit

during the duration of the spring pulses. Given these safeguards, we do not believe that either the March or May pulse will exceed downstream channel capacity.

I understand the importance of flood control provided by the mainstem reservoir system to the people who live and work in the basin and I take this responsibility very seriously. My staff and I, in coordination with the Corps' Northwestern Division leadership, will closely monitor conditions and relevant factors such as levee conditions this spring, and will implement the pulse only if it can be done in accordance with the criteria in the Master Manual. We are committed to an open and transparent decision making process and therefore, as in previous years, we will post frequent updates on our website so stakeholders can see the information we are using to make our decisions.

Please let me know if you have any additional questions. I look forward to seeing you at the MLDDA meeting on 26 February.

Regards,
Jody

Jody Farhat, P.E.
Chief, Missouri River Basin Water Management

jody.s.farhat@usace.army.mil
Office: 402-996-3840
Cell: 402-350-1417

-----Original Message-----
From: Tom & Karla Waters [mailto:waters4@ix.netcom.com]
Sent: Thursday, January 20, 2011 3:30 PM
To: [redacted] NWK
Cc: [redacted] NWK; Hofmann, Anthony J COL NWK; McMahon, John R BG NWD
Subject: Re: Levee Rehabilitation Update (UNCLASSIFIED)

Thanks Des.
Looks like there will still be several levees whose repairs are not completed before a March spring rise. Has any consideration been given to canceling the March rise due to the incomplete levee repairs?
-Tom

On Jan 20, 2011, at 3:12 PM, Goyal, Des R NWK wrote:

> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Tom,
>
> As we did not have the levee rehab update mtg this month, the status
> of levee rehab is as follows:
>
> 1. PIR Status:
>
> All PIRs total 16 for 13 Non-Federal levees and 5 Federal levees (some
> levees are combined into 1 PIR) have been submitted and approved by NWD.
>
> No PIR remaining to be completed.
>
> 2. Funding Status:

> Funds Received - $4,727,675 (Priority 1 Projects)
>
> Additional Funds Required - $445,716 (Priority 2 & 3 Projects)
>
> All Priority 1 projects have been funded. Still awaiting Priority 2 &
> 3 project funding.
>
> 3. Non-Federal Levee Rehab Contract Status --
>
> (Breach) Union Township Levee District (Item 117V) -----Invitation for
> Bid (IFB)-Total Small Business- Bids due 25 JAN
> (Breach) Holt County LD No. 10 Sec 2 (Item 114A) ----- (IFB) -Total
> Small
> Business- Bids due 25 JAN
> (Breach) Baltimore Bend LD (Item 69E) AND Belcher Lozier LD (Item
> 69R) -----
> (IFB) -Total Small Business- Bids due 7 FEB
> (Slides) DeWitt Drainage and LD Sec 2 (Item 60C)---- Developing
> Plans/Specs/Front end- TO advertise IFB/TSB: NLT 31 JAN.
>
> 4. Federal Levees (E&D and Construction Funding received
> 11January2011)
>
> Lower Chariton ---- Under Construction
>
> L-246 --------- Advertise end of February
>
> L-497, R-488, R-471-460 (one contract) Advertise beginning of March
>
> Should you have any questions, pls let us know.
>
> Thanks
>
> Des
>
> Classification: UNCLASSIFIED
> Caveats: NONE
>
>

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

[redacted] NWO

From: [redacted] NWO
Sent: Friday, January 28, 2011 10:19 AM
To: Farhat, Jody S NWD02; [redacted] NWD02
Subject: FW: Reservoir Levels graphic
Attachments: USACE Reservoir Levels Graphic 2010 B.pdf

Jody, [redacted]

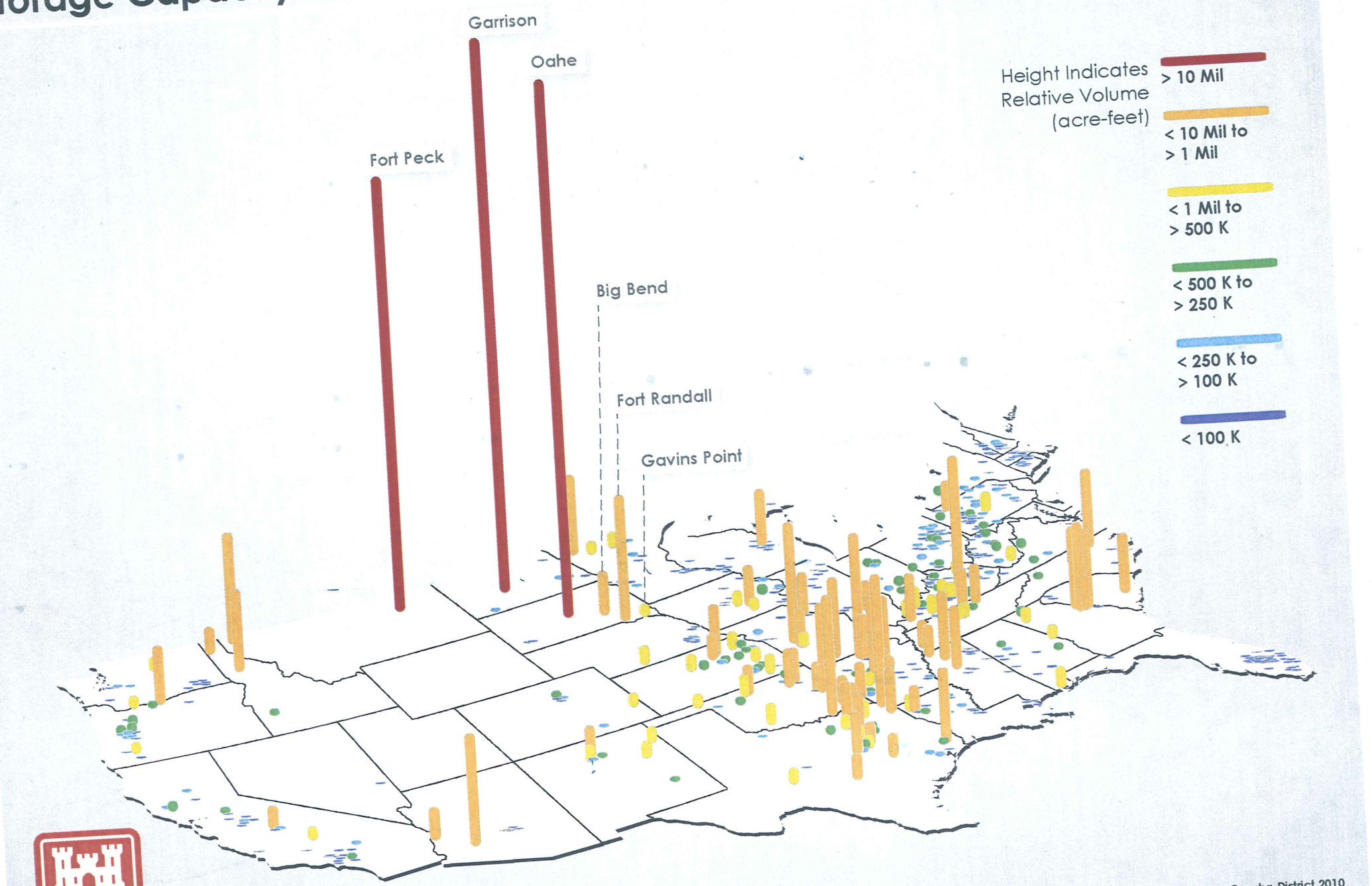
Attached is the latest USACE Reservoir Levels Graphic. Only change is the positioning of the labels for Gavins, Fort Randall and Big Bend.

A copy of the file will be stored in V:\Public\PowerPoint\USACE Reservoir Levels Graphic 2010 B.pdf

[redacted]
Hydraulic Engineer
Reservoir Regulation Team
Missouri River Basin Water Management
Northwestern Division, U.S. Army Corps of Engineers
1616 Capitol Ave.
Omaha, NE 68102
[redacted]

[redacted]

torage Capacity of Corps Reservoirs



US Army Corps of Engineers
BUILDING STRONG

Prepared and Produced by the U.S. Army Corps of Engineers Omaha District 2010

[redacted] NWO

From: [redacted] NWD02
Sent: Friday, January 28, 2011 8:13 AM
To: Farhat, Jody S NWD02
Subject: RE: Presentation for East River (UNCLASSIFIED)
Attachments: snow.jpg

Classification: UNCLASSIFIED
Caveats: NONE

Only a couple comments:

Slide 21 - Might want to add a legend to show the difference between blue and yellow.

Slide 27 - See if the attached looks clearer.

[redacted]

[redacted].
Reservoir Regulation Team Lead
Missouri River Basin Water Management,
Northwestern Division, USACE
[redacted]
[redacted] (fax)

-----Original Message-----
From: [redacted] NWD02
Sent: Friday, January 28, 2011 7:41 AM
To: Farhat, Jody S NWD02
Cc: [redacted] NWD02
Subject: RE: Presentation for East River (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Jody,
Slide #5 - did you want the current storage on the slide? You currently have Oct 15, 2010 storage shown.
Slide #7 - the 2011 forecast is not shown, did you want it? (It is on a later slide so it probably doesn't matter.)

I made a couple of other small changes.

Also, I have some data on spill amounts and approximate energy if you are interested before next week (in case there are questions).

[redacted] is this the way that we will use the mountain snowpack from now on? Are we copying the graphic from Excel? It seems like it needs to be cleaned up a little.

[redacted]

-----Original Message-----
From: Farhat, Jody S NWD02
Sent: Thursday, January 27, 2011 8:23 PM
To: [redacted] NWD02; [redacted] NWD02

Subject: Presentation for East River (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Could you two breeze through the PP I put together for my meeting next week and find all the errors I'm too tried to see right now. It's out on the network in the PP_2011 folder and is the only file in that folder. I have to send this to them first thing in the morning, so a quick review for fatal flaws and little goofs is all I'm looking for.

Thanks,
Jody

Classification: UNCLASSIFIED
Caveats: NONE

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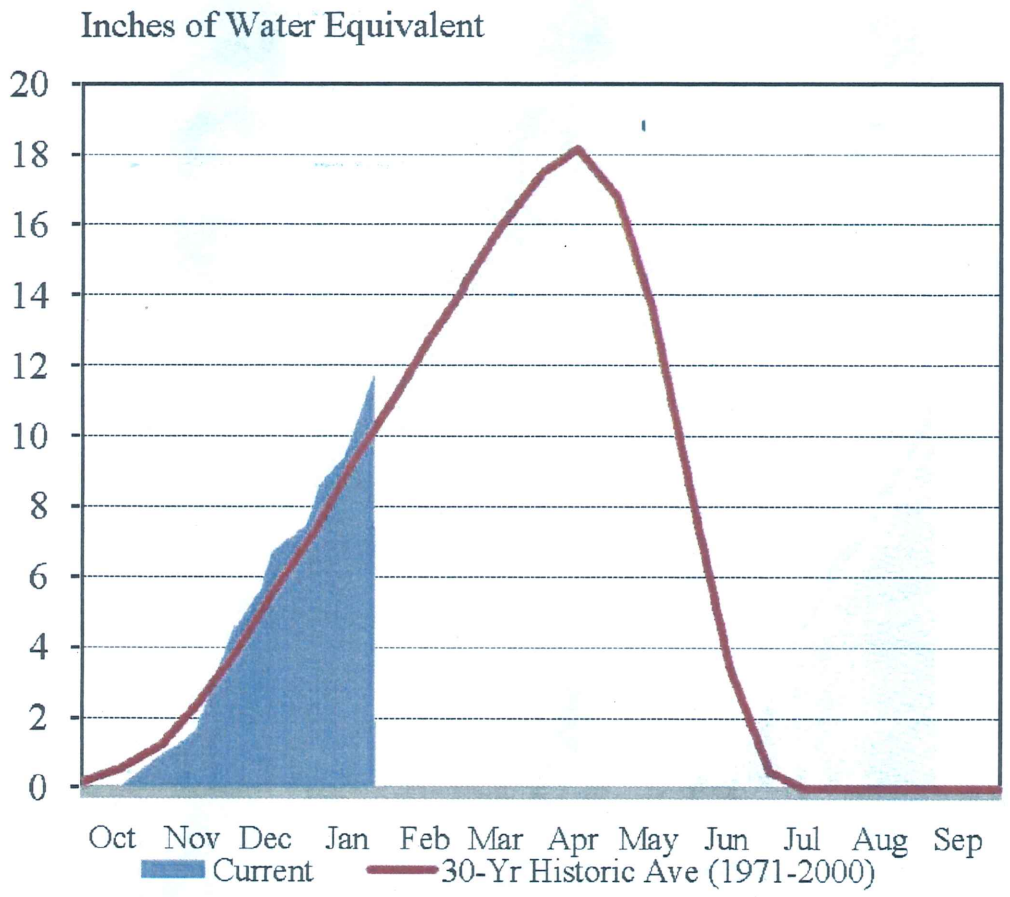
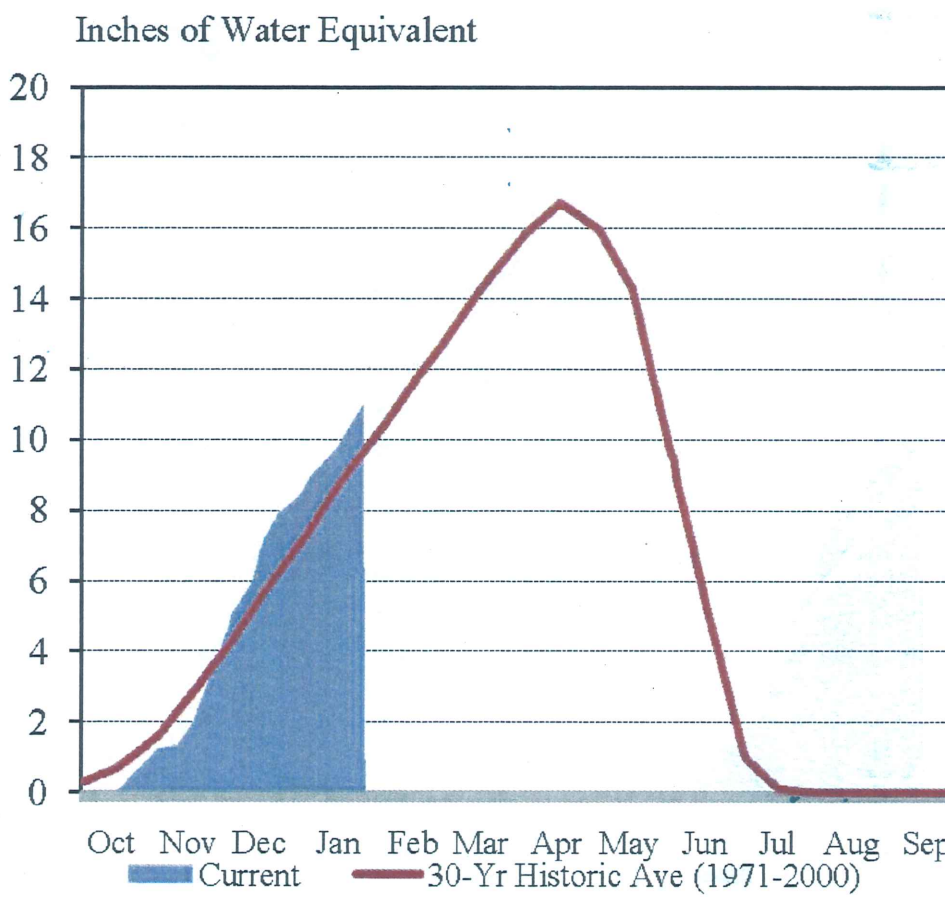
Caveats: NONE

Missouri River Basin
Mountain Snowpack Water Content
2010-2011

Total above Fort Peck



Total Fork Peck to Garrison



Missouri River Basin Mountain Snowpack normally peaks near April 15.
Normally 61 percent of the peak accumulation has occurred by February 1.

24-Jan-2011

Provisional data. Subject to revision.